Smithsonian

August 1993

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Here, a secluded brook in the Great Smoky Mountains (p. 20)

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August 1993

Smithsonian

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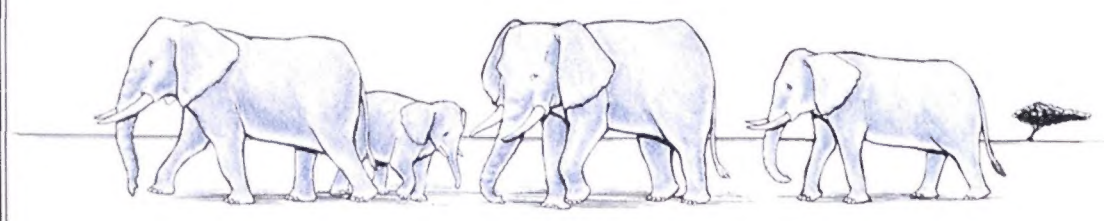

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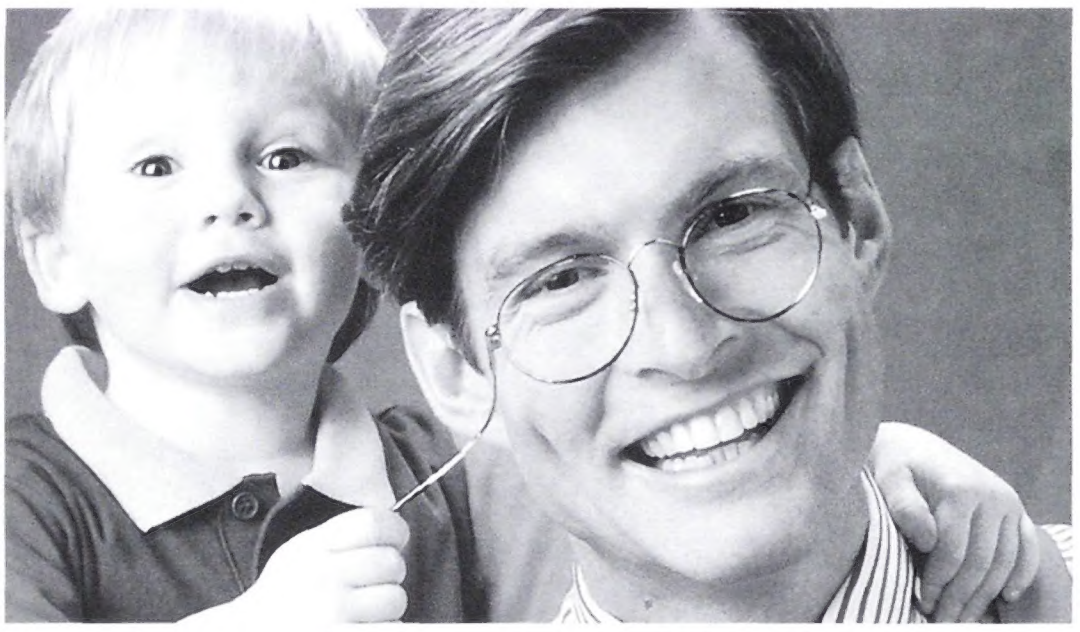

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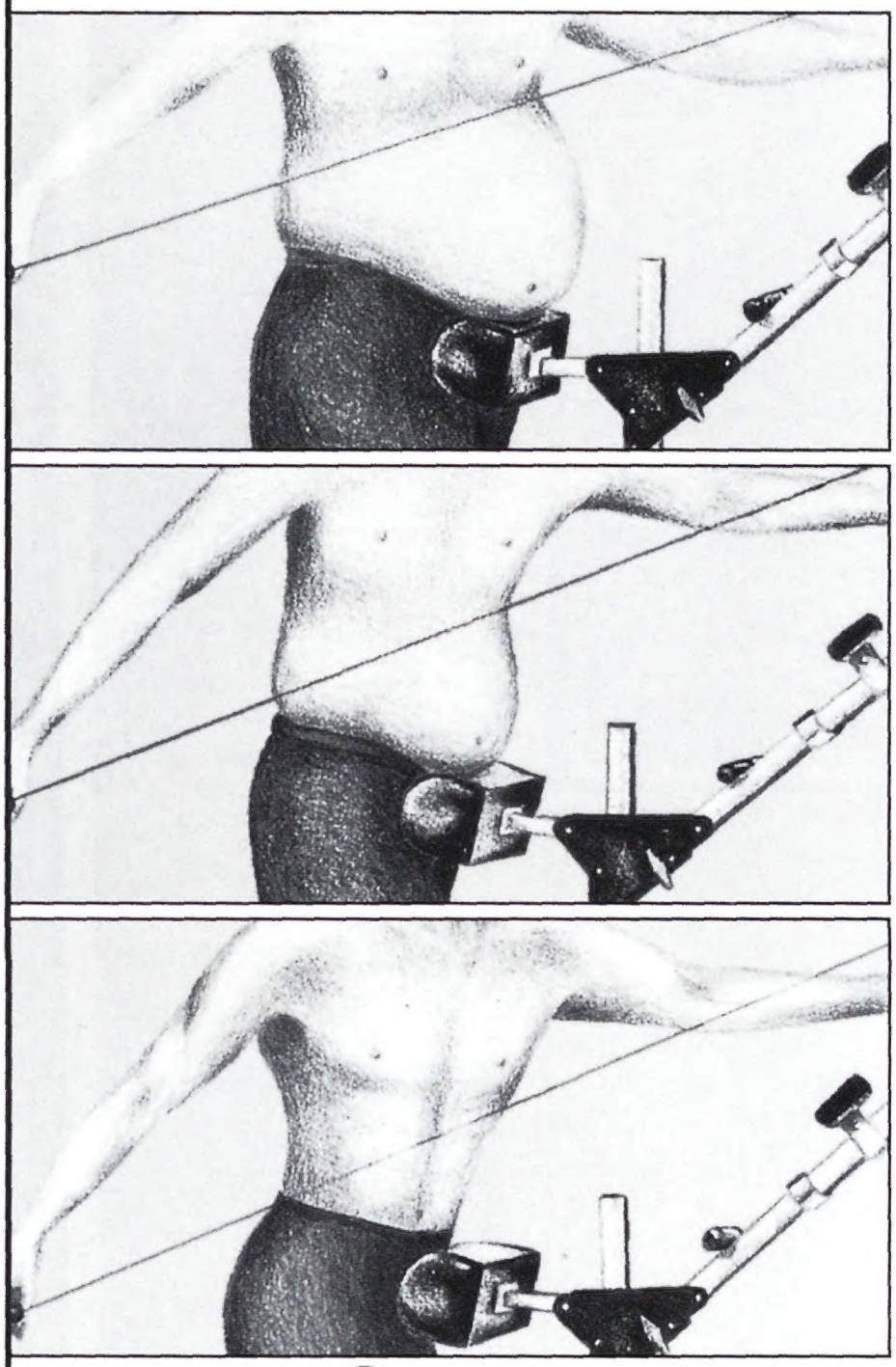

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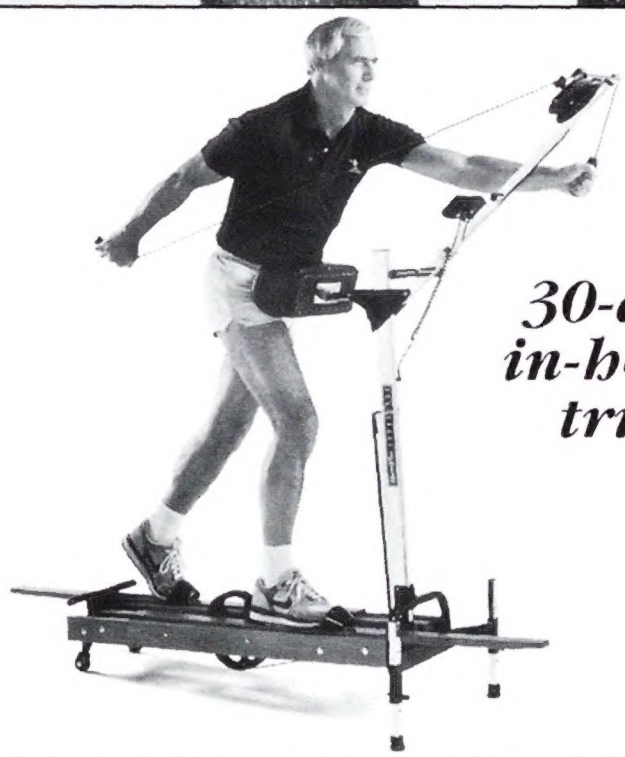

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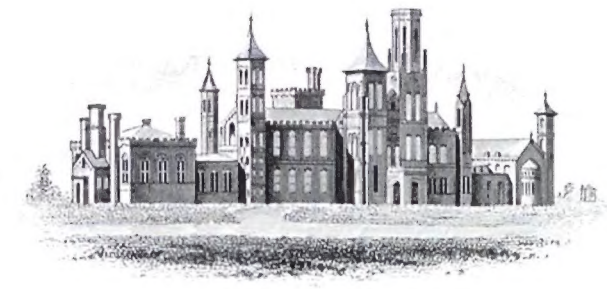
Smithsonian horizons



A new exhibition of 20th-century Native American art sheds light on many diverging, intersecting cultural paths

It is sometimes said that "decontextualization" is the major contribution that art museums make to popular understanding. Having this effect on contemporary work, already largely created in the first instance for impersonal markets, may be superfluous. But throughout most of history things were different. The greater part of what now forms the world's artistic heritage was originally fashioned in association with institutions, beliefs or rituals that imbued individual works with meanings that can never be entirely recovered. By displaying them in carefully neutral settings, museums have usually attempted to focus attention instead on their abstract, esthetic qualities. Thus they are purportedly endowed with a permanent, transcultural place overlying the specific contexts in which they originated.

There is no such thing, of course, as a context-free exhibition. Even for viewers who are wholly uninitiated, the character of the gallery, the crowd, the press reviews, the catalogs and labels all supply associations and an evaluative setting that is unavoidably situated in our own place and time. Above all, the ensemble of works chosen to appear together forms a frame of comparison for an exhibit that highlights some features and neglects others. Let us say instead that exhibits provide designed contexts rather than original ones. But they may still be original, powerful and provocative.

One exhibit that surely is so can be seen at the Smithsonian's International Gallery until October. "Shared Visions: Native American Painters and Sculptors in the Twentieth Century" (which originated at the Heard Museum in Phoenix) is at first glance a vividly confusing blur of style, technique and subject matter. As one begins to recognize its historical principles of organization, however, it tells a moving story of the emergence of new outlooks, concerns and energies out of an earlier preoccupation with elementary preservation and survival.

Early painters in what has come to be known as the Native American Fine Art Movement were often immersed in the trauma and loss of the forced substitution of the "corn road" for the "buffalo road." Beginning with the 1880s, their work displays an understandable, deeply moving concern with the careful preservation of disappearing traditions and cultures. Meticulously recorded ceremonies and costumes, scenes of community life, and haunting episodes of the lost worlds of warfare and the hunt are joined by visual recountings of ancient myths and legends.

Across time, these conventional themes faded. Also receding, as off-reservation residences became increasingly common, were geographic and tribal categorizations of style and subject matter. To be sure, the preponderance of subjects continued to be recognizably Native American. But cultural contexts of the past gave way to others of the artists' own construction out of many diverse influences–only some of them Indian and many of them no longer rooted in Indian communities. New artifacts and modes of adornment were drawn from the contemporary Anglo and Hispanic worlds, and the influence of Mexican muralists is apparent. Individuality of style and viewpoint became pronounced, extending into experimentation by some with abstract and conceptual art. Yet there are suggestions of at least one important thread of continuity that distinguishes most of this work–an underlying, value-laden if not religious preoccupation with the broader issue of the "way people were meant to live."

Inevitably, these directions of growth and change are a source of controversy. If contemporary Native American art is on a convergent course with contemporary art generally, how long can it continue to be held apart as a separate category? Viewed internally, the stream of development can unquestionably be regarded as continuous and without significant leaps or turnings. But for others outside the cultural communities that have sustained the artists, the same trends undermine older criteria that heretofore have dominated collecting. Looming more important from this standpoint are the external sources of most of what has been appropriated and borrowed, raising the issue of "authenticity." Some, therefore, would impose a boundary for what is canonically Native American that stops well short of the modern period.

Further confusing this already contentious picture is the Indian Arts and Crafts Act of 1990. Intended to encourage bona fide Native American artists and discourage the sellers of fakes and imitations, it reserves the term "Indian art" for the work of registered members of recognized tribes. Reportedly, however, this line of formal demarcation has excluded individuals for reasons sometimes having little to do with their heritage. And by legally reifying some art as intrinsically Indian for reasons not inherent in the art itself, it casts into confusion any natural process of growing recognition for the pioneering path that the Native American Fine Art Movement has taken.

It is perhaps here that the "Shared Visions" exhibit has a key part to play. The designed context it supplies permits us to trace the course of an artistic movement as it has incorporated a widening diversity of experience and consciousness of possibility, while yet retaining its authenticity and a sense of its origins.

Letters to the Editor

Columbian Exposition

Dear Sir: "It might have been." The Exposition, discussed in your June issue, was to have had a Spectatorium, on the lake shore in Jackson Park, developed by theatrical innovator Steele MacKaye. The 10,000-seat structure was to present the story of the discovery of America, with full-sized reproductions of the *Santa Maria, Niña* and *Pinta* floating on a 17-million-cubic-foot lagoon in the stage area. A 50,000-candlepower sun would illuminate the day scenes, with moving clouds, and every evening the constellations were to be visible just as they were on the same date in 1492. The story, in pantomime, was to be captioned with pyrotechnics, accompanied by a 120-piece orchestra and a chorus of 600 directed by Anton Seidl. Antonin Dvorak was commissioned to develop the symphonic treatment (from which came portions of his *New World Symphony*); Victor Herbert composed additional music.

George M. Pullman and Chicago financiers guaranteed funding of $2 million. The superstructure was in place in February, when an unprecedented storm collapsed the 1,000-ton roof, and a simultaneous national financial crash made it impossible to secure funds for repair and rebuilding.
Horace W. Robinson
Eugene, Oregon

Dear Sir: For many years the American public had little faith in the ability of our musicians to produce serious music, so they turned to European composers.

In 1892 the planners of the Chicago World's Columbian Exposition wanted a piece of music to commemorate the event. In tune with the times, they commissioned the great Russian composer Alexander Glazunov to compose one. He had a deep respect for the American musical vernacular, and the resultant "Triumphal March" is nothing more than variations of the well-known "John Brown's Body."
William L. Boyd
Fort Collins, Colorado

Dear Sir: It is particularly fitting that Marshall Field's, the department store, is commemorating the anniversary, as it was from this Chicago institution that the president of the Columbian Exposition, Harlow N. Higinbotham, was chosen. Then, the Dedicatory Ball at the Auditorium, one of the most brilliant social affairs ever witnessed in Chicago, was given by Marshall Field with Maj. Gen. Nelson A. Miles, George M. Pullman and N. K. Fairbanks.

The Marshall Field building, designed by the same architects who were responsible for the the world's fair, represents the embodiment of American architecture at a time when, at the fair, it reached a peak in national expression.
Homer G. Sharp
Historian, Marshall Field's
Chicago

Dear Sir: Chicago got its "Windy City" moniker from a New York City newspaperman who tired of all the boasting done by Chicago newspapers about the Exposition.
Richard H. Schaefer
Willoughby, Ohio

Dear Sir: We San Franciscans are preparing to celebrate the centennial of our 1894 California Midwinter International Exposition, held in Golden Gate Park, where people were encouraged to come throw oranges in the sunshine. Today's Japanese Tea Garden was a part of 1894's Japanese Village.

Many of Chicago's exhibits were shipped West by train to be shown for a second run in San Francisco.
Marilyn Blaisdell
San Francisco

Dear Sir: While lecturing at Colorado College in the summer of 1893, Wellesley College English professor and poet Katharine Lee Bates was inspired by the view from the summit of Pikes Peak to write the words to "America the Beautiful."

She had spent a weekend in Chicago, visiting the Columbian Exposition, and later recalled, "The White City made such a strong appeal to patriotic feeling. . ." that it contributed to the last stanza "Thine alabaster cities gleam. . . ."
Stephen R. Haggart
Colorado Springs

The Nubians

Dear Sir: The Metropolitan Museum of Art will add to the current appreciation of Nubia with its exhibition "The Gold of Meroe," on view from November 23 to March 31, 1994. Visitors will see the complete set of more than 200 pieces of jewelry that once belonged to Meroitic Queen Amanishakheto in the second half of the first century B.C. The entire collection, from Munich and Berlin, has never been seen in the United States.

Intricately worked pieces combine ancient Egyptian jewelry techniques with methods of glass enameling and juxtapose Pharaonic motifs with native Nubian symbols indicative of the high artistic level of Nubian culture.
Dorothea Arnold
Metropolitan Museum of Art
New York City

Stairs

Dear Sir: Perhaps the main reason the pyramid steps at Chichén Itzá are "daunting" to tourists is that when one looks back from the top of the flight, the edges of the steps form what appears to be a smooth sheet of gray glass.

Many a tourist, panicked by this illusion, has had to be helped down by a local tour guide.
James G. Sealy
Westwood, New Jersey

Dear Sir: It may be that the designer of Vaux-le-Vicomte intentionally increased stair dimension as the stairway descends into the garden, to force the arriving dignitaries into an increasingly stately gait. The more likely motive, I believe, was that of optical illusion. Reducing the stairway dimensions as it ascends exaggerates the perspective view of the chateau as seen from the garden. The flight of stairs appears longer than it actually is, and hence creates the impression the chateau is farther away, making it seem larger and more impressive.
Dustin Shuler
Inglewood, California

Dear Sir: What opera lover can forget the fatal fall, in 1966, of the promising young German tenor Fritz Wunderlich

from a stairway in Heidelberg? He was only 36, about to make his Metropolitan Opera debut.

Or who can forget the duel in the 1938 movie *The Adventures of Robin Hood*, fought in part on the stairway in the royal castle between Robin Hood and Guy of Gisbourne, played by Errol Flynn and Basil Rathbone, respectively.
Fred MacFadyen
North Arlington, New Jersey

Dear Sir: A stairway fall also claimed the life of Winston Churchill's mother, Jennie Jerome Churchill.
Jacquelyn Myers
Tehachapi, California

Dear Sir: The "miraculous staircase" of the Loretto Chapel in Santa Fe, a gravity-defying, unsupported helical spiral [below] was constructed in 1877 by a mysterious itinerant carpenter who then disappeared without taking any pay. That fact, along with the religious site and the amazing design, delicacy and strength of the staircase, gave rise to the quaint legend that the brilliant craftsman was in fact Saint Joseph. Originally the staircase didn't have a railing, but in 1887 a banister was added at the request of the nuns —for obvious reasons.
Audrey Chamberlin
Washington, D.C.

Stair's original appearance (left) was re-created by airbrushing a modern view.

Dear Sir: How about Marcel Duchamp's painting *Nude Descending a Staircase?* And the "stairs" films: Alfred Hitchcock's *Notorious* and *Vertigo*, and *Stairway to Heaven* by Michael Powell and Emeric Pressburger. The latter movie had a giant escalator to heaven, no doubt inspired by the biblical Jacob's ladder.
Terry Bigham
Fairhaven, Massachusetts

Dear Sir: ". . .water gushing along a flue down a stairway's center"? Water gushes down a flume; hot air soars up a flue.
Charles W. Mathews
Las Cruces, New Mexico
By no fluke can water gush down a flue. Ed.

Jean Dubuffet

Dear Sir: Your article exhibits the insanity, absurdity and inanity of one whose "art" was nothing but an insult to intelligent people and serious artists. And this man held classical Greek and Roman art in contempt?
James Sulkowski
Canonsburg, Pennsylvania

Dear Sir: Helen Dudar, speaking of a Dubuffet one-man show in Paris in the fall of 1944, states that it occurred "a few months after the end of the war in Europe." The war in Europe ended on May 8, 1945.
Margaret K. Petters
Barrington, Illinois

Ship models

Dear Sir: Now the country can realize what a treasure the Naval Academy has in the dockyard models. As a midshipman over 20 years ago, I often wondered about the history of these models, scattered almost haphazardly throughout the academic buildings. Some of the best were in Mahan Hall, and it was difficult to study in the library without spending time admiring the exquisite craftsmanship. The superb laparoscope photograph confirmed detailed interiors that I had many times imagined.
Terry Tilton, Cdr. USN
San Diego

Dear Sir: Despite your caption on page 104, the *Chesapeake* was taken as a prize of war to Halifax, Nova Scotia, by HMS *Shannon* and not destroyed.

Following repairs, the *Chesapeake* was taken into the Royal Navy to serve as a warship. In 1820 she was sold for scrap in Plymouth, England, and broken up.
Frederic Ray
Harrisburg, Pennsylvania
A ship does not have to be sunk to be destroyed. The Chesapeake *was rendered helpless, shattered by point-blank broadsides, her rigging shot to pieces. The green crew cowered belowdecks, the captain was killed, and most officers and all but 10 of 44 marines were killed or wounded.* Ed.

Object at hand

Dear Sir: When my youngest brother was graduating from high school I decided the most wonderful gift I could give him would be a chance for him to hear Marian Anderson. I cashed in some bonds and bought four tickets to her concert, for my mother, my brother, a graduating friend of his, and me.

The young men went backstage and asked for her autograph. My brother returned, so thrilled, and said "Oh Sister, if you could have looked into her eyes, they were so soft and tender."

It made me very happy to know I had given him something he valued so much, that no one could ever take from him.
Anna Murchison
Houston

Dear Sir: In the early 1920s my mother, then Catharine Richardson, studied piano with Giuseppi Boghetti, who was Marian's voice teacher. Mother was Marian's regular accompanist at the studio. At a contest, Marian was last on the program. Judges often stopped contestants in the middle of their songs by rapping on the table, saying, "That's enough—next!" Boghetti took Mother and Marian Anderson aside and said, "If the judges tell you to stop, you keep going."

When their turn came, Marian began to sing, and the hall seemed to stand still. There were no interruptions. As the notes faded, the crowd erupted in spontaneous cheers.
Peter Boor
Ontario, California

Dear Sir: Marian Anderson lived out the last of her days in Portland, where I was shopping when her death was announced. There were tears in the eyes of anyone 40 and older as word spread from person to person. I felt I was hearing again the spirituals at the end of her concert that I was privileged to attend many years ago.
Janet Flower
Portland, Oregon

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Phenomena, comment and notes

Rocks, icebergs and oxygen samples suggest Earth has adapted to sudden temperature changes every 7,000 years

If you think the weather is weird these days, you should have seen it 10,000 years ago. Hurricane Andrew? Snowstorm of the Century? Forget them—they were peanuts compared with what was happening then. Earth has seen some really tough times and still bears the scars.

Take the last ice age. Plowing like bulldozers, glaciers covered Canada and the northern United States with a layer of ice more than two miles thick. When it finally melted 10,000 years ago, the materials it had deposited created features such as Cape Cod in Massachusetts and the moraines that dot Wisconsin and Illinois.

But the glaciers aren't through with us, it seems. A few years ago scientists studying the oozy sediments on the floor of the North Atlantic noticed strange layers of rocks and pebbles that seemed to have been laid down while those glaciers dominated the continent. Chemical analysis of the rocks showed them to be identical to ones found in Canada. Judging from their layering, furthermore, they seemed to have been dumped every 7,000 years or so.

So here's mystery number one: How did huge amounts of Canadian rock end up on the floor of the Atlantic Ocean thousands of miles from home?

The only way to explain rocks in the mud is to assume that they had arrived frozen in icebergs that had picked them up in Canada, floated out into the ocean, then melted and released the rocks. The layers seemed to be saying that every 7,000 years one of these iceberg armadas sailed out into the North Atlantic, leaving the rocks as a calling card. These occurrences came to be called "Heinrich events," after Hartmut Heinrich, the German earth scientist who first discovered them. Mystery solved.

Then things turned even stranger. Studies of oxygen atoms in the sediments around the rocks, and in Greenland ice cores, showed that while the rocks were being deposited, the temperature of the North Atlantic was plunging, perhaps by as much as 10 degrees F in 50 years. It was that 10 degrees estimate that made me sit up. Most people who have written about global warming (including me) have asserted that a rise of 2 to 10 degrees in the next century could spell disaster. It is not so much the size of the warming, we have argued, but the speed. You cannot, we said, expect to move Miami weather to Boston in a century without a massive die-off of plants and animals. Yet here is evidence of just such instantaneous (in geological terms) changes—without any corresponding evidence of biological disasters. We have

Do you ever get motion sickness? You know that queasy, nauseous feeling?

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Doug MacAyeal is one of those rare birds who enjoy working in Antarctica.

lots of evidence for "great extinctions," some of them probably caused by climate. But none of them is believed to have happened so quickly, and none of them show a 7,000-year cycle.

This "climate flickering," it turns out, is almost certainly caused by those same fleets of icebergs sailing out into the North Atlantic. They have the effect of turning off the conveyor belt that normally transports warm water to high latitudes, keeping them significantly warmer than they otherwise would be. How we found this out is a good story in itself.

One of the wonderful things about science is that every so often a totally unexpected phenomenon such as climate flickering pops up, confounding the conventional wisdom and generally stirring up all sorts of turmoil. When solutions to the puzzles start to be proposed, they often come from out in left field, from someone who was thinking about another problem entirely. If you're lucky and have been around for a while, you may find out that the person doing the explaining is an old friend.

In my case, I was lucky. One of the people involved in explaining Heinrich events is Douglas MacAyeal of the University of Chicago. Doug is one of those rare people who study glaciers and ice sheets–the kind who think nothing of camping out in Antarctica for months at a time. He's also a terrific storyteller. My favorite is about how one pilot dealt with "whiteout" (a condition in which low clouds combine with the ice sheet to eliminate the horizon and disorient even the most experienced traveler). It seems this guy would stick his head out of the window and listen to the engine sound bouncing off the ice to judge his altitude.

I have always had a fascination with polar exploration. Not that I'd want to do it myself, but I've always been curious about what drives other people to go to these forbidding places. In Doug's case, the road to Antarctica was a circuitous one. Growing up in Cleveland, he spent a lot of time sailing on Lake Erie. He chose to go to Brown University in Rhode Island because he noticed a course on yacht design in the catalog. He was totally unaware that scientists at Brown were working out the details of the ice ages that have dominated the recent climate of our planet. A *Time* maga-

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Transderm Scōp should not be used in children and should be used with special caution in the elderly. See **PRECAUTIONS.**

Since drowsiness, disorientation, and confusion may occur with the use of scopolamine, patients should be warned of the possibility and cautioned against engaging in activities that require mental alertness, such as driving a motor vehicle or operating dangerous machinery.

Potentially alarming idiosyncratic reactions may occur with ordinary therapeutic doses of scopolamine.

PRECAUTIONS

General. Scopolamine should be used with caution in patients with pyloric obstruction, or urinary bladder neck obstruction.

Caution should be exercised when administering an antiemetic or anti muscarinic drug to patients suspected of having intestinal obstruction.

Transderm Scōp should be used with special caution in the elderly or in individuals with impaired metabolic, liver or kidney functions, because of the increased likelihood of CNS effects.

Information for Patients. Since scopolamine can cause temporary dilation of the pupils and blurred vision if it comes in contact with the eyes, patients should be strongly advised to wash their hands thoroughly with soap and water immediately after handling the patch.

Patients should be advised to remove the patch immediately and contact a physician in the unlikely event that they experience symptoms of acute narrow-angle glaucoma (pain in and reddening of the eyes accompanied by dilated pupils).

Patients should be warned against driving a motor vehicle or operating dangerous machinery. A patient brochure is available.

Drug Interactions. Scopolamine should be used with care in patients taking drugs, including alcohol, capable of causing CNS effects. Special attention should be given to drugs having anticholinergic properties, e.g., belladonna alkaloids, antihistamines (including meclizine), and antidepressants.

Carcinogenesis, Mutagenesis, Impairment of Fertility. No long-term studies in animals have been performed to evaluate carcinogenic potential. Fertility studies were performed in female rats and revealed no evidence of impaired fertility or harm to the fetus due to scopolamine hydrobromide administered by daily subcutaneous injection. In the highest dose group (plasma level approximately 500 times the level achieved in humans using a transdermal system), reduced maternal body weights were observed.

Pregnancy Category C. Teratogenic studies were performed in pregnant rats and rabbits with scopolamine hydrobromide administered by daily intravenous injection. No adverse effects were recorded in the rats. In the rabbits, the highest dose (plasma level approximately 100 times the level achieved in humans using a transdermal system) of drug administered had a marginal embryotoxic effect. Transderm Scōp should be used during pregnancy only if the anticipated benefit justifies the potential risk to the fetus.

Nursing Mothers. It is not known whether scopolamine is excreted in human milk. Because many drugs are excreted in human milk, caution should be exercised when Transderm Scōp is administered to a nursing woman.

Pediatric Use. Children are particularly susceptible to the side effects of belladonna alkaloids. Transderm Scōp should not be used in children because it is not known whether this system will release an amount of scopolamine that could produce serious adverse effects in children.

ADVERSE REACTIONS

The most frequent adverse reaction to Transderm Scōp is dryness of the mouth. This occurs in about two thirds of the people. A less frequent adverse reaction is drowsiness, which occurs in less than one sixth of the people. Transient impairment of eye accommodation, including blurred vision and dilation of the pupils, is also observed.

The following adverse reactions have also been reported on infrequent occasions during the use of Transderm Scōp: disorientation, memory disturbances, dizziness, restlessness, hallucinations, confusion, difficulty urinating, rashes and erythema, acute narrow-angle glaucoma, and dry itchy, or red eyes.

Drug Withdrawal: Symptoms including dizziness, nausea, vomiting, headache and disturbances of equilibrium have been reported in a few patients following discontinuation of the use of the Transderm Scōp system. These symptoms have occurred most often in patients who have used the systems for more than three days.

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zine article on catastrophe theory (a precursor of today's theories of chaos) and a subsequent bull session got him thinking about the fact that there are systems in nature in which small changes can produce enormous effects (SMITHSONIAN, December 1987). Given the ferment going on around him at Brown, it was natural to apply the idea to the ice ages, in which a small change in Earth's climate might easily "tip the balance" and start the glaciers moving again.

This idea, in turn, led him to Antarctica, where the last great ice sheets on our planet still dominate the land. To understand what scientists learned about ice sheets you have to know a little bit about how the Antarctic glaciers work. On the eastern part of the continent, the ice sits three miles thick on solid ground. This ice doesn't move much–it just grows and falls off the edge once in a while. In western Antarctica, however, the story is different. Much of the land is actually below sea level, and the ice spreads out over the ocean like an oil slick. It flows to the sea in thousand-mile-long "ice streams"–rivers of ice in the stationary sheet. These streams are really dramatic. "You'll fly for hours and see nothing but flat ice," says MacAyeal, "then, suddenly, you'll see the ribbon of broken ice and crevasses that marks the stream." The history of these streams is quirky. They flow for a while, stop flowing, then open up again. One thing is certain, though–they account for virtually all the movement of ice on the western Antarctic sheet.

During the 1980s scientists discovered that when the pressure of the ice over soft rock reaches a certain level, the rock fractures, mixes with water, and turns into a material that is roughly the consistency of toothpaste. When this happens, the "toothpaste" provides lubrication, and the overlying ice can move quickly–speeds of tens of feet per day are not at all uncommon.

It was this understanding of ice sheet dynamics that gave Doug MacAyeal his key to the Heinrich events. He is as at home in front of his computer terminal as he is out on the ice. About a year ago he was developing a computer model of ice flow in the western Antarctic ice sheet when he happened to read an article about Heinrich events. He realized almost immediately that there was a connection between the flow of ice in Antarctica today and conditions in the North Atlantic 10,000 years ago, when a similar ice sheet covered North America. This insight eventually led him to a picture of how Earth might have behaved during the last ice age.

The key point in the theory is that while most of the rock in northern Canada is hard and crystalline, the rock in the Hudson Bay is softer. When the glaciers above Canada built up to a height of 6,000 feet or so, the pressure at the bottom was enough to turn the rock into toothpaste. When this happened, the entire ice sheet over Hudson Bay would slide out into the North Atlantic and break up, creating just the sort of iceberg armadas that Heinrich and his colleagues described. According to Doug's calculations, the glacier should grow to the height it needs to initiate one of these events every 7,000 years–just what the oceanographers see. And the armadas could easily produce the unstable climate that seems to go along with them.

"Right now," explains MacAyeal, "warm water from the tropics moves north in the Gulf Stream, then cools and sinks to the ocean floor, eventually flowing back around Antarctica and into the Pacific. Wallace Broecker [of Lamont-Doherty Earth Observatory] calls this the 'Great Conveyer Belt.' But if the icebergs bring a lot of fresh water into the North Atlantic, the water will become less saline and won't sink. The Great Conveyer Belt will be turned off and the North Atlantic will cool."

This is an extraordinarily simple and appealing notion about how Earth's climate works. It says that the rapid changes in climate depend on the way glaciers interact with the rock that supports them. It illustrates just how sensitive the system of the planet can be to change, and how resilient the web of life has to be to have survived those changes.

Before we start drawing all sorts of philosophical conclusions from the theory, however, we have to ask one crucial question: Is it right? In science, it's not enough to have a neat idea. The idea has to stand up to the scrutiny of the scientific community. Even as you read this, other scientists are checking through data to put Doug's idea to the test. If it passes, it will join the ranks of accepted theories about how the planetary climate system operates. If it doesn't, it will be one more good idea that didn't pan out. In a year or so, I'll talk to Doug again and let you know how things are going. Stay tuned!

James Trefil
Robinson Professor of Physics
George Mason University

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Smithsonian highlights

Planning a Smithsonian visit?

Receive a free Associates' Planning Packet. Write Smithsonian Information, Smithsonian Institution, Washington, D.C. 20560, or call (202) 357-2700; hearing-impaired service, TTY: (202) 357-1729. *Note:* Parking near museums is limited. Members are encouraged to use the Metrorail subway system (details in packet).

Begin your visit at the Smithsonian Information Center's Associates' Reception Desk–open from 9 A.M. to 4 P.M. daily–in the "Castle." The Court dining room, located in the National Museum of Natural History, is open daily, 11 A.M. to 3 P.M.

Extended summer hours

The American History, Natural History and Air and Space museums are operating on extended hours daily from 10 A.M. to 6:30 P.M. through Labor Day, Monday, September 6. Hours at the National Zoo are 9 A.M. to 4:30 P.M. daily for buildings, and 8 A.M. to 8 P.M. for grounds. Other Smithsonian museums are generally open from 10 A.M. to 5:30 P.M. daily.

Special August exhibits, events

National Zoological Park
What's new at the Zoo? See *Highlights continued*, page 18.
Amazonia A microcosm of the world's largest rain forest and river habitat.

National Museum of American History
Beyond Category: The Musical Genius of Duke Ellington (through September 6) Exhibit organized by NMAH and the Smithsonian Institution Traveling Exhibition Service looks at the 50-year career of the composer and bandleader. Show includes manuscripts, rare photographs, artifacts and film clips.

National Museum of Natural History
Dinosaurs: A Global View (through September 6) Sculptures, paintings and sketches trace the evolution of dinosaurs.
EarthSense (through September 6) Photographs focus on global efforts to safeguard our planet.

National Air and Space Museum
A "Blueprint for Space" (through April 1994) Artworks commissioned in the 1950s by *Collier's* magazine to "sell" dream of space flight to the American public.
Hidden Hawaii (6:45 P.M. on selected evenings) New Imax film features spectacular underwater footage.

National Museum of American Art
Paul Cadmus (through October 10) Ten works including controversial 1934 painting *The Fleet's In!*
Folk Art Across America (runs indefinitely) The creativity of self-taught artists.

National Portrait Gallery
Brushes with the Literary: Portraits by Washington Artist Marcella Comès Winslow (August 13-December 5) An insider's view of cultural life in the nation's capital in the 1940s and '50s.

National Postal Museum
The Smithsonian's newest museum, located next to Union Station on Capitol Hill (see page 76).

Freer Gallery of Art
America Meets Asia Asian and 19th- and early 20th-century American art, including important works by James McNeill Whistler.

Arthur M. Sackler Gallery
Joined Colors: Decoration and Meaning in Chinese Porcelain (through November 28) Fifteenth- through 19th-century polychrome porcelains.
The Golden Age of Sculpture from Sri Lanka (through September 26) Fifty-two ancient masterpieces of bronze casting.

National Museum of African Art
Astonishment and Power: Kongo Minkisi and the Art of Renée Stout (through January 2, 1994) The *minkisi* tradition of the Kongo peoples of central Africa and an African-American artist who draws on it.

Hirshhorn Museum & Sculpture Garden
Jean Dubuffet 1943-1963: Paintings, Sculptures, Assemblages (through September 12) Some 100 works including portraits, streetscapes and nudes.

Renwick Gallery
American Crafts: The Nation's Collection (runs indefinitely) Works in a variety of craft media–glass, clay, fiber, metal and wood.

Anacostia Museum
Always There: African-American Presence in American Quilts (through October 17) Quilts, photographs and personal objects from the 19th and 20th centuries.

International Gallery, S. Dillon Ripley Center
The Egypt Story: Photographs by Fred Maroon (through August 22) Images document the land, the architecture, the people.

Cooper-Hewitt Museum (New York)
Mechanical Brides: Women and Machines from Home to Office (August 17 through January 2, 1994) Domestic appliances and office equipment and the women who have used them.
The Process of Design: Cheryl R. Riley (through September 26) A "Designer Focus" show drawn from the museum's African-American Design Archive.

Exhibition catalogs

Catalogs available currently include:
Brushes with the Literary: Letters of a Washington Artist 1943-1959 ($29.95 cloth)
Jean Dubuffet 1943-1963: Paintings, Sculptures, Assemblages ($60/$29.95 paper)
A Blueprint for Space ($60/$24.95 paper)
Astonishment and Power: Kongo Minkisi/ The Art of Renée Stout ($34.95 paper)

To order, send check or money order to Smithsonian Museum Shops, 8308 Cinder Bed Road, Newington, Virginia 22122. Include 15 percent of purchase to cover postage, handling (minimum, $1.75).

Smithsonian on the air

Smithsonian Presents Invention Explores the innovative spirit. Tuesdays at 9 P.M., EST, on the Discovery Channel. Check local cable listings.

Smithsonian Institution Traveling Exhibition Service

SITES organizes and circulates exhibitions to cities throughout the United States and abroad. To sponsor a show in your community, write SITES, Smithsonian, Washington, D.C. 20560.
• Lubbock, Texas (August 29-September 26) *Capturing the Spirit: Portraits of Contemporary Mexican Artists*, Texas Tech University Museum.

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L E N O X. S I N C E 1 8 8 9.

What's new at the Zoo?

Thirteen Komodo dragons hatched in special environmental chambers, a Masai giraffe born in a thunderstorm, a gorilla adopted at birth by a foster mother, a pygmy hippo named Curley Sue Parmesean, twin sloth bear cubs, red wolves, prairie dogs and a white-cheeked gibbon.

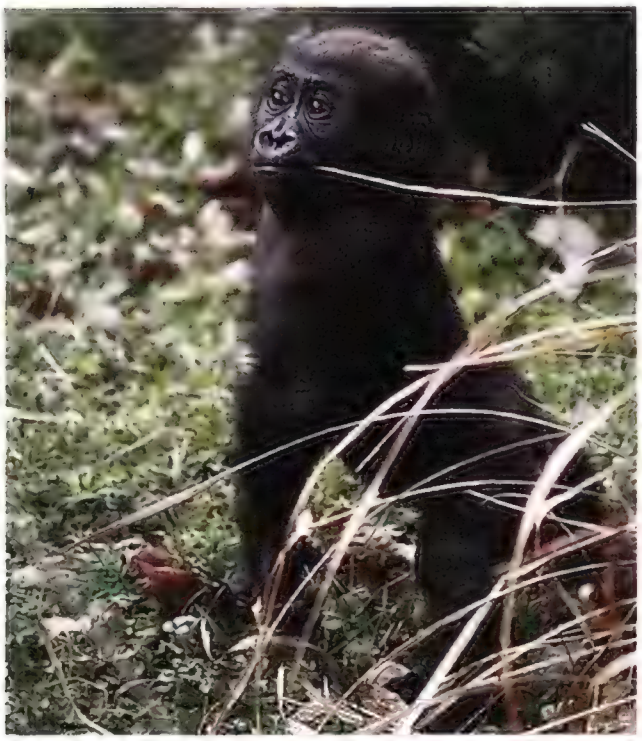
This has been a year of remarkable births at the Smithsonian's National Zoological Park. In what Zoo biologists called the "herpetological event of the century," the Zoo became the first locale outside Indonesia to reproduce successfully the rare and endangered Komodo dragon, the world's largest lizard.

It was a dark and stormy afternoon when Grif, a 12-year-old Masai giraffe, went into labor. Her 150-pound calf, aptly named Stormy, finally made his debut at 5:30 P.M., a little late in the day for giraffes, who are almost always born between 10 A.M. and 2 P.M. in the wild.

According to a reliable source, the Zoo's newest female pygmy hippo, born on April 19, is "cute as the dickens–like a little eggplant with legs." She was the 58th pygmy hippo calf to be born at the Zoo.

Another unique event took place when Baraka, a male gorilla, was born to 25-year-old Haloko in April 1992. Haloko disappeared from view during the birth, and 15 minutes later Mandara, another female in the group, emerged with the wet infant. He has remained in her care since. Haloko has, however, exhibited what keepers call "aunting" behavior.

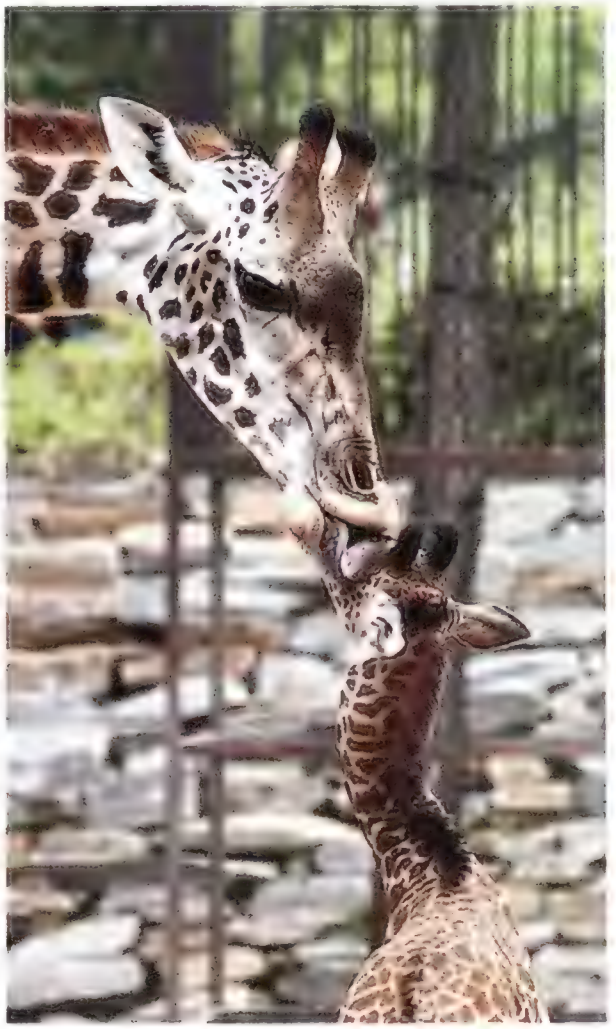
Why not come greet our new friends?
Diane M. Bolz



Newest addition to Zoo's gorilla family, 14-month-old Baraka has a foster mother.

Strikingly marked Komodo dragon takes first step as it emerges from its leathery egg. Four-ounce hatchling may weigh 1,200 times that as an adult.

New 11-pound baby pygmy hippo sidles up to mother, who at 2 $\frac{1}{2}$ feet tall weighs in at about 600 pounds.



Masai giraffe Grif nuzzles her new calf, Stormy, born outside elephant house. The 150-pound male stood nearly 6 feet at birth.

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Buckle up, America!

Glassy stretch of Little River (opposite) and swarm of tourists at Cades Cove visitor center (above) present a study in contrasts at the Great Smoky Mountains National Park, which receives nine million visitors a year.

By David Nevin

Tranquillity, tourism—and trouble: the Great Smokies have it all

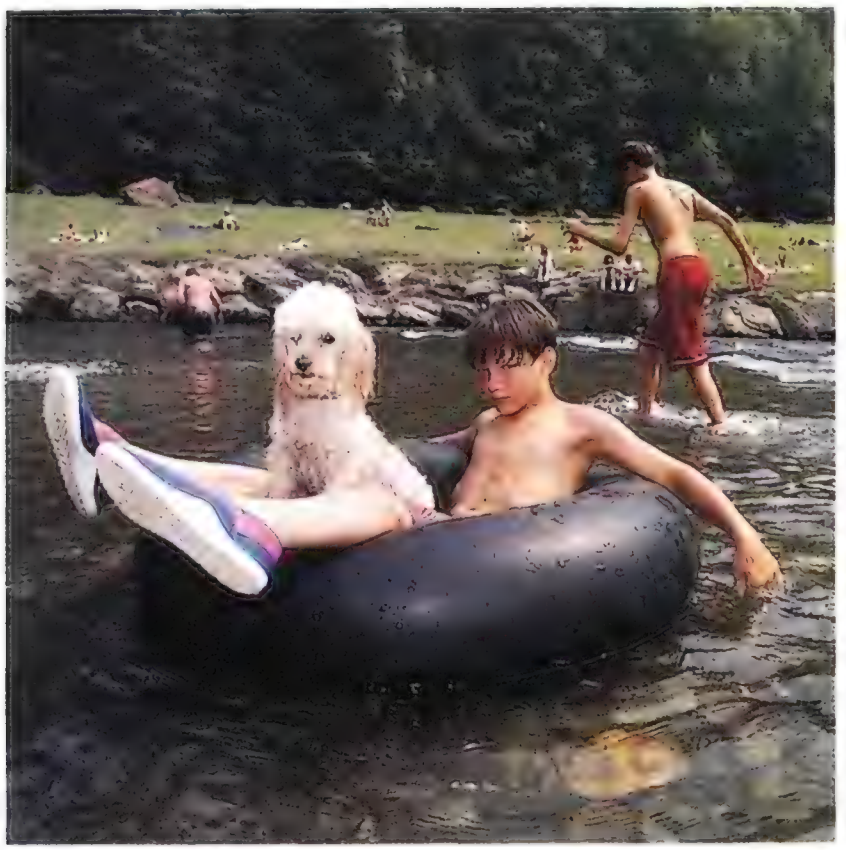
Like most national parks, this spectacular Eastern preserve is a place where opposites blend, but the question is: For how long?

I am on Trillium Gap Trail in the Great Smoky Mountains National Park, for an evening hike of a few miles to Grotto Falls. It'll be dark in an hour or two. The trail winds through a mature hemlock forest, massive trees with brown-black bark deeply ridged and scaly, feathery needle canopy overhead. Now and then a smooth-barked birch appears, its serrated leaves pale splashes against somber hemlock.

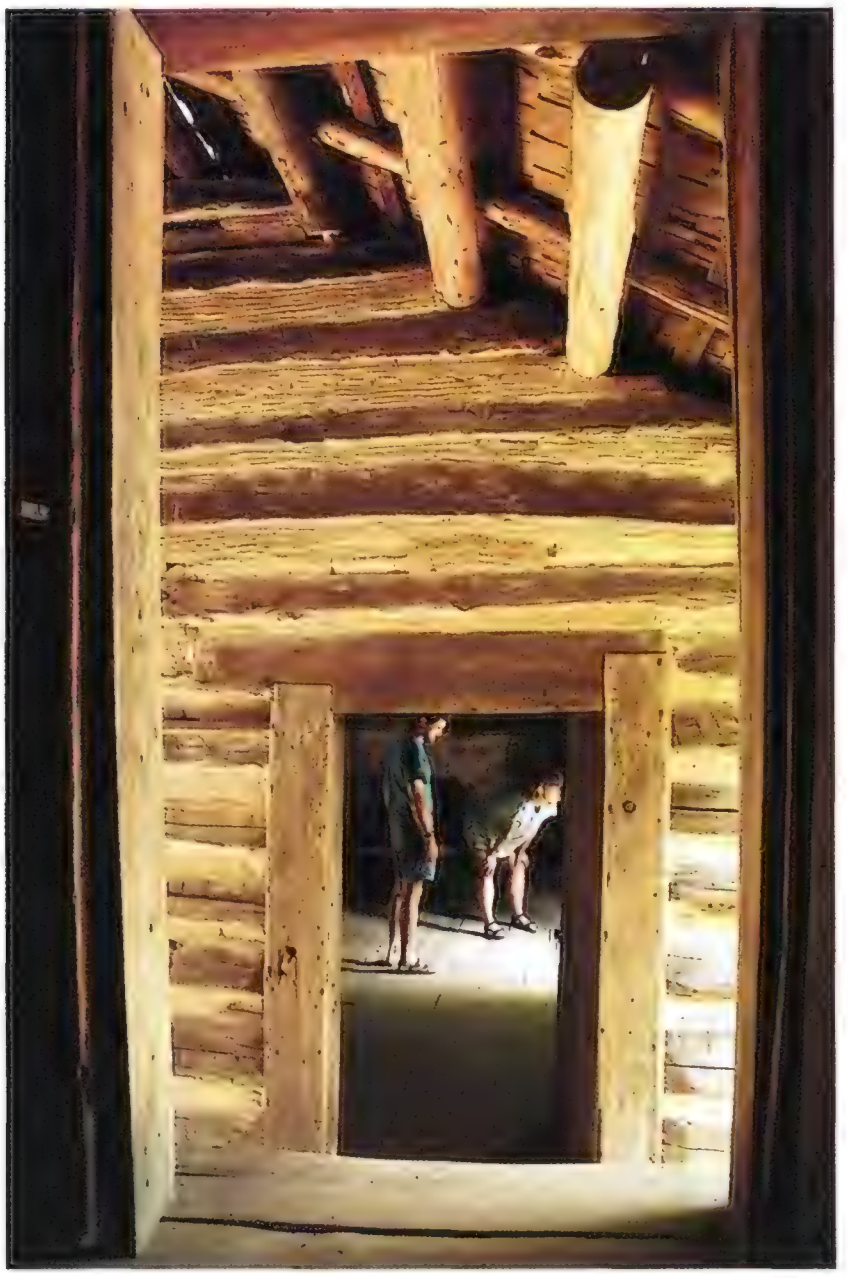
The trail steepens. It's cut into the edge of a sharp slope. I pass rhododendrons in white bloom, avoid poison ivy, see a pile of bear scat, come to a dead birch still standing, its rotting trunk ripped by bears in search of grubs. Claw marks are evident in the torn wood. The majesty of this mature forest with its evidences of the wild is striking. But so are the unmistakable signs of distress. The trail is cruelly compacted. Water bars, designed to spill runoff downslope, are wearing out. Hemlock roots exposed by erosion seem barely able to grip the earth.

I'm pondering this when I hear a sharp snuffling grunt from above. Up the slope I see a black bear of about 150 pounds. Then I see she has two cubs. I stop, hoping she'll let me see her babies clearly. They are about 4 months old, gangling, inquisitive, cute. Suddenly she starts down, sliding as she comes. At the trail she stops, grunts sharply, and the youngsters slide after her. What a show! They're about 30 feet away. They'll go on down as I watch.

Photographs by Ted Wood



Poodle takes youngster tubing at a popular swimming area in the park while sunbathers relax on dry land.



Couple inspects cabin at Cades Cove, a mountain village that has been authentically re-created by Park Service.

But they don't. She turns and starts toward me. I freeze. In a moment she'll pass me, two hikers meeting on the trail. But that will put me between her and her cubs, definitely the wrong place to be. I walk backward. She follows. Surely she sees me, but I have the feeling she's not interested in me or the food in my pack. She just wants to walk that trail and doesn't care that I'm on it. But maybe she will care if we meet. I turn and walk briskly down the trail, but she keeps up. I go faster. So does she. The cubs follow.

From above, loud urban voices

The trail turns. I pass, then wait. Here she comes–I hurry on. Then I hear voices from above, a large party including children. They're city voices. No mountain person would be so loud on the trail; it's disrespectful to the forest. Loud urban voices, the determined bear on the quiet trail–it's a metaphor for the tension in which the park lives, a wild or semiwild place in an increasingly urban nation.

Close to nine million people visit this park every year. No other national park draws such crowds, and they put tremendous pressure on an essentially fragile wilderness. Yet the press of people is only one of the multiple pressures threatening this great preserve.

The park sprawls across the Tennessee-North Carolina border, some 520,000 acres or 812 square miles, with altitudes of 900 to 6,600 feet (including two of the highest mountains in the Eastern United States) and rainfall from 55 inches at low altitudes to 85 inches at the summit, where the climate in July approximates that of Maine. It's an area of stunning biological diversity that may be the best preserved temperate deciduous woodland in the world, including about 100,000 acres of virgin timber. Some species reach record size–red spruce, eastern hemlock, basswood, Carolina silverbell, Fraser magnolia, northern red oak, yellow buckeye. Checklists are essential–130 species of trees, more than 1,500 flowering plants, 65 ferns and fern allies, 230 lichens, 1,800 fungi, 45 species of fish, 240 species of birds, as well as 66 species of mammals including 2 rabbits, 3 moles and 8 shrews, 11 bats, 5 squirrels, a meadow jumping mouse and a woodland jumping mouse, bobcats, foxes, coyotes, red wolves, deer and above all, that critter of critters, the black bear, *Ursus americanus*.

Unlike the great Western parks, Great Smoky originally was developed private land, small farms cut into pastures and cornfields by stone fences, rather than public land still in wilderness. Settlers poured into these mountains at the turn of the 19th century, displacing the Cherokee, whose culture is marked today in the adjoining Cherokee Indian Reservation. A century later, moves for preservation began.

The park was authorized in 1926, started in 1934 on

Black bear emerges from woods near a busy park road.

Tourists pile out of their cars to watch the animal. "Bear jams" are a daily occurrence in the park. Rangers break them up when bears get antsy.

land purchased from often unwilling owners and dedicated in 1940. The wilderness returned as buildings fell. But a few buildings were preserved–a pioneer farmstead, a gristmill, an entire community in Cades Cove. Speaking so clearly of an age now past, they became cultural artifacts, history on view, palpable evidence of pioneer roots.

So the park today is a dichotomous blend of almost opposite expressions, the experience of the wild cast against that of the cultural. This fits the National Park Service's mission to contribute to the public's sense of a shared national identity. The considerable cost of maintaining the cultural artifacts, however, adds to the ever more intense pressure the park faces.

The National Park Service as a whole is in trouble. It has 367 units, including battlefields, historical parks, national seashores, monuments, recreation areas and memorials, but the crown jewels are the 51 areas designated as national parks. Two statistics tell the story: in real dollars, the Service's core operating budget hasn't changed in a decade, but visits to its units have risen 25 percent. This shows up in everything from maintenance delayed to the danger point to low pay that is driving the best rangers to other occupations. The Service recognizes these threats. In 1991, its 75th anniversary, it called a three-day conference to air problems and discuss goals, then published a 136-page self-critique analyzing its faults and proposing solutions. This report is all the more striking for its parallels to the powerful parks-in-crisis alerts issued regularly by the Service's leading critic and booster, the National Parks and Conservation Association. The pain is obvious in the Great Smokies. Maintenance is behind. Crowds threaten to overwhelm. Incursions from outside challenge the park's sanctity. The wild side erodes. Exotic pests, animal and insect, explode. And park rangers, those striking, reassuring figures in their Smokey Bear hats, actually are an endangered species.

So you can view the Smokies as a case study of parks in trouble. Yet when you go there and walk through towering forests on silent trails and see facilities clean and well kept and rangers in neat uniforms responding to problems, dangers and queries with equal dash, the place takes on a different look. Then it is more like a great ship plowing through rough seas, under great strain yet somehow managing not only to stay on course but to appear almost serene in the process. In fact, few visitors to the Smokies see anything but further justification for the extraordinarily high regard the polls show Americans have for their Park Service.

Today on Trillium Gap Trail, having my bear encounter, I hurry down the mountain, the bear steady on the path behind me, grunting to keep her cubs moving. The trail winds around tight shoulders. Again and again

David Nevin is a historical novelist who last wrote for SMITHSONIAN *on Sam Houston and the Battle of San Jacinto in July '92 and Peggy Eaton in May '92.*

A pair of park rangers minister to a young girl who suffered relatively minor injuries in a biking accident.

At the scene of an auto mishap, rangers ponder how overturned vehicle can be removed from rocky riverbed.

she appears, cubs trailing, and I hurry on. The voices above are keeping pace with us, garishly loud in the forest stillness. We're nearing the trailhead; she's walked me all the way down. Another turn. I wait. This time she doesn't appear.

Presently the party from above comes into sight. The man in the lead carries a stick. "Did'ja see the bear? Bear'n two cubs. Where'd it go?"

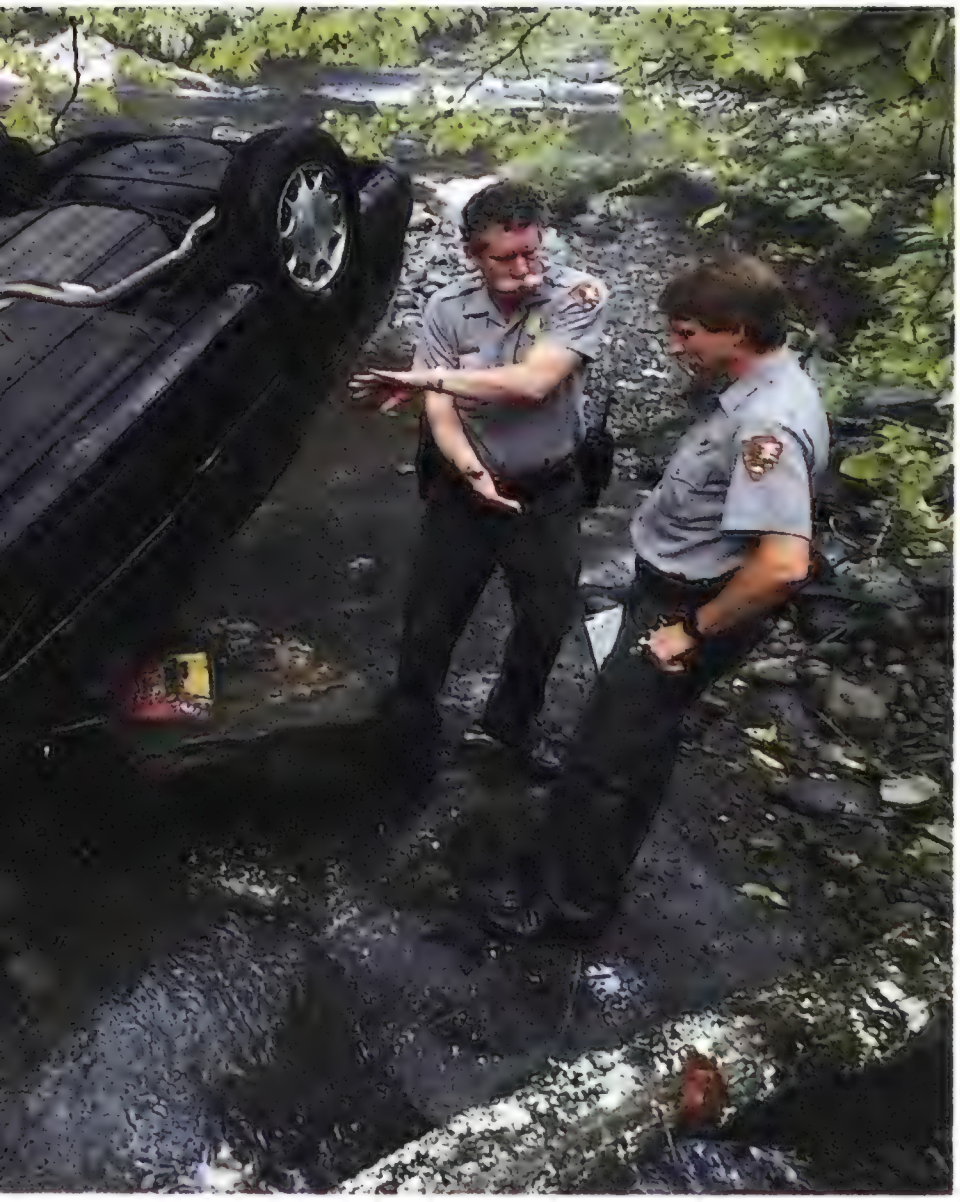
I start back up the mountain, resuming my walk. A woman bringing up the other party's rear glances at me with dread. "You alone? Oh my God! Better get yourself a good stick."

I feel there is no real danger in the situation, and talking to rangers later confirms that view. Yet the bear did speak to the basic clash between wild and nonwild and hence to the park dichotomy, since the mission is both to "preserve and protect" for the future and provide "use and enjoyment" now. The 600 bears in the park walk the line between the two.

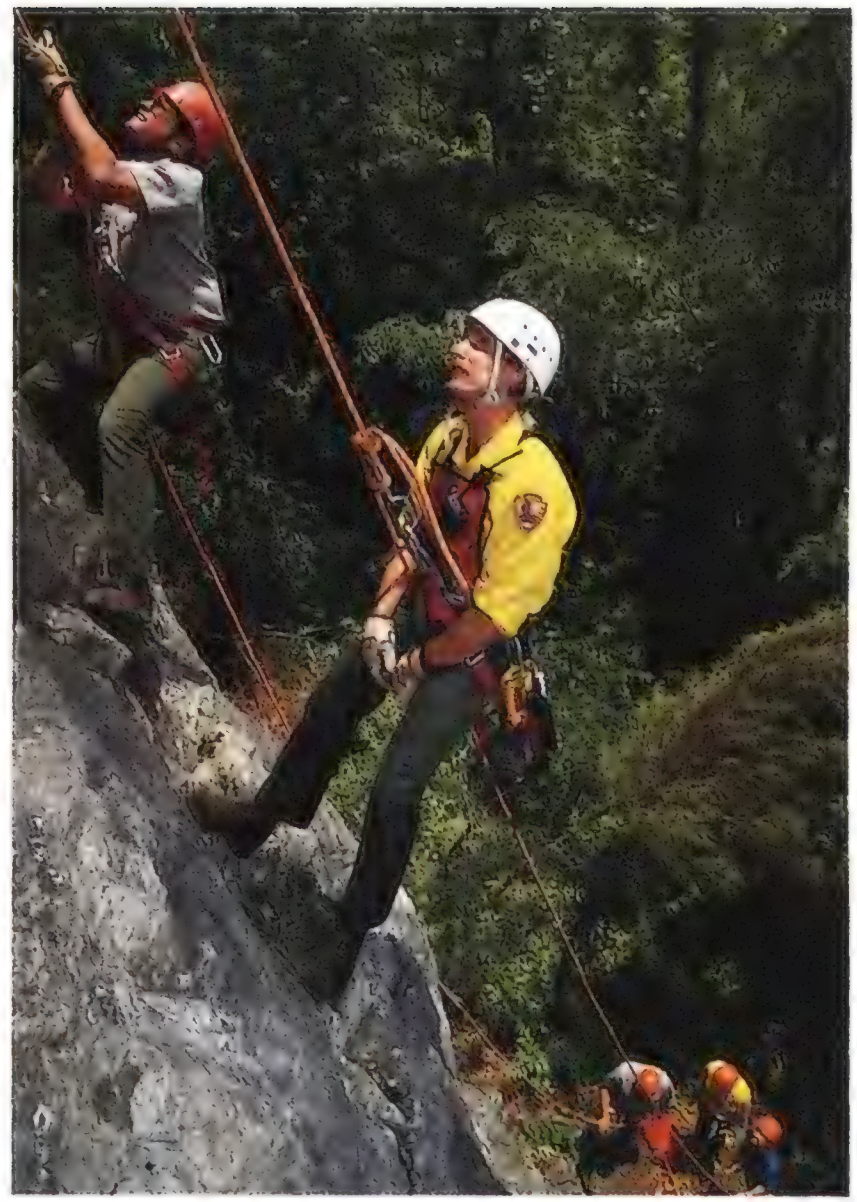
On a typically busy summer Sunday I stop by Newfound Gap, the high point on the highway that bisects the park. A huge parking lot has been carved from the mountain. Its slots are marked with white stripes and each is full. Children tumble at play. A Frisbee floats in the air. People line up to take each other's picture by an information placard. A few try the Appalachian Trail, which crosses here, but none go far. A Hare Krishna missionary stands in a space the size of a car stall, carefully outlined in yellow, one of the park's three free speech boxes–a tribute to the First Amendment. A Michigan woman has locked herself out of her rental car. The rangers can't crack it, and she sits disconsolately on her bumper, awaiting a commercial locksmith summoned from below by radio.

That evening I'm on the narrow, one-way, 11-mile loop road that circles through the restored mountain community, Cades Cove. Ranger Robert Regner and I are looking for a "bear jam" and soon find it. Bear jams are daily phenomena. More than a half-million cars traverse this road every year, sometimes bumper to bumper. When a bear appears they stop with doors gaping; occupants jump out with cameras, and traffic is blocked.

We arrive as one is forming. A bear with two cubs is grubbing acorns in an oak grove. Oblivious to people,



They are responsible for seeing that injured get to the hospital, notifying wrecker and filling out reports.



Ranger Jack Piepenbring (right) rappels a rock face during a training session with emergency rescue team.

she strolls into a grassy field, cubs frisking behind her. The view is fine and more cars stop. Regner walks along telling drivers to pull to one side. One cub climbs a big basswood. More cars stop. The mother strolls on. The cub, alarmed, slides down the tree and gallops after her. Gasps, shouts, laughter, cries, echo from the road. The bear parallels the road, creating instant new jams as she goes. Presently she wants to cross. The ranger clears a path. New cars stop. Once over the road, she wants to cross again, and then again. More cars. Cries, kids tumbling out, cameras burning film. It's like a day at the beach. Bears are wild, Regner warns.

Someone whistles. "Don't whistle up the bear," Regner says.

"Why? Will it come?"

"It's irritated enough. Harassing wildlife is against the law."

A tall, fat fellow with skinny legs in shorts, minicam on his shoulder, is following the bear. He circles her, ignoring Regner's shouts. The bear, peevish, has had enough. She charges with a roar. Her speed is startling. No human can outrun a bear. The fat fellow squeals and runs, skinny legs pumping, minicam clutched to his shoulder. The bear stops to eat ants, and Regner briskly moves people away.

A mile farther on they've stopped again. Deer with fawns are grazing in the dusk. Regner sighs. "A Bambi jam," he says.

At the Icewater Spring shelter for hikers on the Appalachian Trail, Keny Slay, chief backcountry ranger for the Tennessee side, is showing two high school girls how to build a fire. He lays a cone of straws and twigs. The girls watch skeptically. He had caught them squirting fire starter onto sparks, which can lead to an explosion and a flight to a burn ward.

The pressure on the park is nowhere more evident than at this most heavily used shelter. The ground is packed harder than the worst trail. There were so many toilet holes nearby that the park had to bring up a pit privy by helicopter, and they've had to move it four times. The shelter—stone walls on three sides, tin roof, two long bunks on the inside for a dozen sleeping bags—has a greasy, worn, abused look.

The twigs are damp and the fire is slow to start, but

Keny Slay, chief backcountry ranger for Tennessee side of the park, inspects a heavily used trail. Although skilled in woodcraft, Slay and his colleagues operate increasingly as law-enforcement officers fighting crime.

Slay keeps at it, blowing now and then. The girls shake their heads. A flame rises, falls, takes hold, grows. He gradually adds larger sticks. It strikes me that he's the perfect image of the ranger the public sees, handsome in his crisp uniform, skilled in woodcraft, ever helpful. But the image is deceptive. Rangers certainly are helpful, but the defining image here is Slay's .357 revolver. As never before, the force today is divided: Slay and others like him are law-enforcement rangers facing basic police duties, dealing with the crime that increasingly presses on national parks.

On another day I'm with rangers Jack Piepenbring and John Stobinski when we see a rusty orange pickup nosed into a park-road turnout. The back is full of watermelons. A sign says $3. A short, fat man with red hair and a fussy manner gets out of the truck as the rangers turn in. Piepenbring approaches, and Stobinski fans out to the right so smoothly I miss the import until I get between him and the scene and he motions me back sharply. "Just in case," he says softly, and I realize this is a typical police situation. Just a penny-ante hustler—but every cop knows such a figure can explode, pistol or knife in hand.

Illegal produce sellers are the least of it. Speeders, collisions, poachers after bear gall bladder for the Asian market, forest fires, ginseng diggers who'll rip out 100-year-old plants for the roots, larceny in campgrounds, car theft, fistfights, assaults, child abuse, troublesome bears, rape, nurserymen digging out rhododendrons, big crimes, little crimes, park crimes, people crimes—in short, police work. It isn't so much that lawbreaking is growing in national parks as that it's growing in the society, and the parks reflect the society.

Early one morning I'm in Keny Slay's office talking about another problem. Ranger Steve Kloster listens to a crackling radio. He's tense: if the signal comes he'll be leading a bust, and if so, I want to be there. Meanwhile, Slay is talking.

"Some of the low-elevation pastures from the old days, they're still open or they can be opened easily. These people hike in and plant a regular crop and then they come back and work it, fertilizing, irrigating, everything. We've flown over and seen whole plantations—you can tell marijuana, you know, from the color. We'll see a big field, wholesale production, thousands of plants. Stake it out, put it under surveillance, wait for 'em to come—well, I'll tell you, these old boys know there's big money involved and they sure know they're breaking the law.

We assume they're armed and we're careful, but we've nailed our share of 'em. Of course, what we're really interested in is getting rid of the crops."

When I finally leave, the radio hasn't spoken. Kloster stares out a window, biting his lip.

Slay's radio sounds on another day, the voice measured, calm: ". . . fell from Spruce Flats Falls . . . broken leg for sure . . . friend says he's bleeding so it's probably compound. . ." Kloster is already filling a backpack with equipment. He's the backcountry emergency medic and also participates in search and rescue. When an F-15 went down in the park and the pilot ejected, Kloster and another ranger rappeled into the woods from a helicopter to search for him. The temperature would be 15 below that night, and the pilot had no survival gear. "We found him, hydrated him, got him nine miles through the woods and out of there. I doubt he would have survived the night."

"Spruce Flats," Slay says. "That's 50 feet if he fell all the way from the ridge. We better go." They roar off with blue lights blazing.

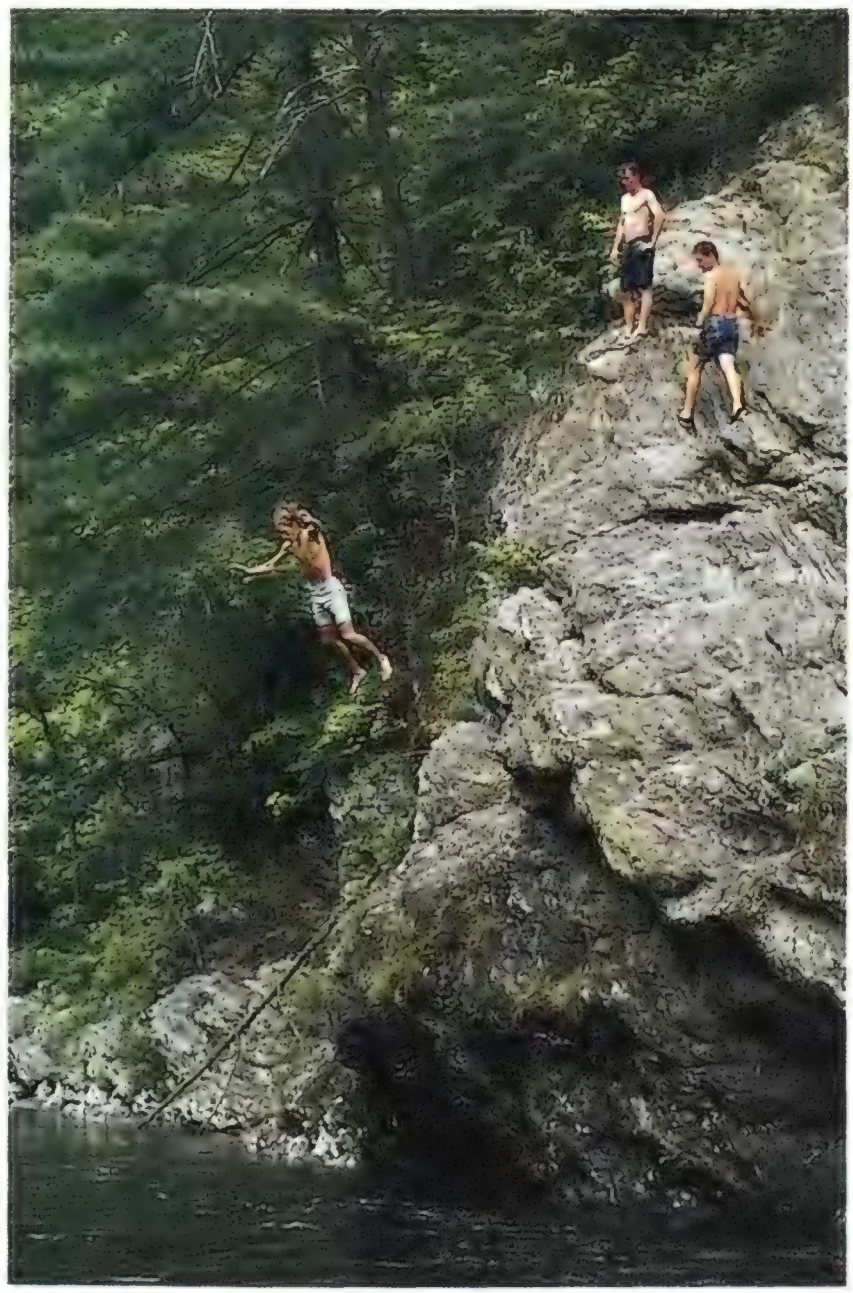
I catch up with Slay on the middle prong of Little River. He's rigging two half-inch climbing lines over the stream in narrow parallel, anchoring them to trees. The stream is 40 feet wide, 1 to 3 feet deep. I cross, clinging to the ropes, go into a hole up to my waist, the water a cold shot, struggle out and start up a steep slope. Kloster has gone ahead. A path cut only this day leads through huge rhododendrons. It steepens until I'm faced with 50 feet that's nearly perpendicular. I drag myself up, clinging to branches and roots. They'll bring a litter down this?

Saline, oxygen, a splint—and skill

The way bears off, skirts a sheer drop of 40-odd feet, goes over a ridge, and I'm looking down into a basin, the falls a clean sheet of water striking a pool below. A knot of rescuers below me encircles a figure in a blue aluminum litter. A saline solution bottle is rigged for intravenous injection, an oxygen mask hides the victim's bearded face. He howls with pain. Someone takes his pulse, another his blood pressure, another reports by radio to a physician in Knoxville who authorizes morphine. The leg is in a splint; a muddy foot protrudes, toes quivering.

Jack Piepenbring heads the extraction team. "If you're not carrying, get out of the way," he tells me sharply. I stand clear, wondering how they'll handle that slope. The litter goes hand over hand to men crouched on slippery rocks. They climb to the ridge, then follow the new path, moving fast, skirting the sheer cliff without pause and coming to the 75 degree downslope. Piepenbring rigs a new line to a tree; he'll let the rope carry the weight while they try to control the litter. The patient is conscious but sedated. His raised hand encounters a rhododendron leaf, feels it. There's little talk. The rescuers start down, clutching at roots and branches, a ranger above paying out line, the litter held at a lurching 45 degree angle. I follow rapidly, but they're already at the stream, placing themselves with the litter between Slay's double lines. Then the ambulance is off, lights flashing, while the rangers go to a country store near the park for hot dogs. They stand around swapping tales, winding down after the carry-out.

"All my jobs are arduous duty," says Chief Ranger Jason Houck. "Run, jump, climb, lift, stay up all night, fight fires." That's the argument, of course, for retirement after 20 years for law-enforcement officers; what a 30-year-old does eagerly a 50-year-old may hesitate over or pay for with a heart attack. But Houck knows that other, more critical problems are at the root of an internal tension the public can't see that is gnawing away at the rangers. Sinking morale, poor pay, haphazard recruitment—all add up to downright disrespect.



Creating a moment that could have been painted by Norman Rockwell, teenagers leap from rock into river.

"My people are versatile, imaginative, skilled in all sorts of things," Houck says. "I'll stack 'em man for man, woman for woman, against other federal agents, FBI, Secret Service, DEA, you name it." A rookie ranger is a GS-7, a civil service classification paying some $23,000 a year. Other federal agents can start as GS-9s for several thousand dollars a year more.

Steve Kloster is a GS-7. He is 31 years old and has two children. He may rappel out of helicopters, be an emergency medic, save lives, conduct marijuana busts, lead search-and-rescue teams and fight fires, but until recently, buying a house was an elusive prize. He shrugs. "I know some rangers who went over to OPM [Office of Personnel Management] at Knoxville, and they make $10,000 more investigating federal job applicants." He makes a face. "I don't know . . ."

Even the entry process is weirdly unfair. In the standard scenario, one must hire on as a seasonal ranger, working a half-year with no assurance this will ever lead to permanent status. "It's an equity issue," Houck says. "My people are good and they deserve recognition, same as any other federal law-enforcement agent gets." But that means money and this comes back to the basic problem of rising use and shrinking budgets.

"I've got in excess of 350 miles of road, 200 of 'em paved. I've got 900 miles of trail, 45 water systems, 35 sewage systems, 73 sets of rental units to be maintained, 150 cemeteries left over from the old days, 350 buildings of which 150 are designated as historic structures." Bob Wiley is chief of maintenance. A trim man with bushy gray hair and a cultivated mustache, he works under constant pressure.

"The whole park budget is about $9 million, park visitors run about nine million–a buck a head, right? Maybe 5,000 people go through a visitor center on a busy day, spend an average 11 minutes–and every one of 'em hits the restroom. Five thousand flushes a day–that tells you something about why we've got 40 restrooms that need to be rebuilt. You can keep 'em clean, you can paint 'em, but when you wear 'em down and they get tired, there's just so much you can do."

To see the pressure for yourself, go to the nine picnic grounds or the ten campgrounds with their 1,008 spaces, each with trailer and awning, aluminum camp chairs, charcoal fires, smoking hamburgers. On impulse one day I turn into Chimneys, a picnic area of 89 sites named for an odd rock formation. It's well designed, each site with table and fire pit artfully placed for privacy, but it has a crushed look, ground packed hard, grass worn away, tables marred and greasy, trash scattered. It's like a busy urban park.

Roads should be resurfaced every 12 to 14 years. Right now they get done every 20 years or so. The one to Cades Cove is 12 years old. It's still smooth but much patched and laced with millions of cracks. Driving along, I see the park as a handsome dowager fallen on hard times, her fine clothes clean but threadbare, her jewelry going piece by piece.

Severe erosion around roots, caused by foot travel and runoff, becomes a problem for tree and hikers alike.

Markers warn drivers away from road damage caused by a collision on one of the park's busiest arteries.

The park experience is broad, far beyond the scenic roads and vista turnouts that everyone sees. At the visitor centers, picnic grounds, pioneer buildings and campgrounds, you find interpretive rangers, a different branch from law enforcement. Go with one on a nature walk as he makes trees, plants, seasons, the very cause and effect of nature seem as immediate as a detective story. Listen to an ebullient young ranger named Jeanne Renfro describe in lyric terms her "love affair with the Smokies." Inevitably your own park experience is broadened. But for me it is the trails through the forests that most define the park experience. And trails, too, are in trouble.

One morning I join a trail maintenance crew. We start down Road Prong Trail toward Chimneys in a steady rain, my poncho tangling on the scythe I'm swinging. I'm with Darris Clabo, Mike Cameron, Stanley Huskey and foreman Ed Grooms. Trail crews once had six workers and now have four. One person can care well for 15 miles a year; these workers must each handle 50 miles a year.

The men are kind to me, Clabo and Cameron schooling me in the intricacies of the scythe, warning me of wasp nests and rattlesnakes on the high, dry side of the trail. When Grooms figures my shoulders are about to go he switches me to clearing the trail of the rhododendron branches Huskey takes down with his ax. They move fast, miles to cover before dark, time just for the basic treatment that will keep the trail open. I hurry along, hurling Huskey's cuttings aside, always a little behind, now drenched to the skin as the rain increases. He tells me his grandfather's farm was taken for the park, but the bitterness has faded. "Not just because I have a job. If we didn't have the park, there wouldn't be any wilderness." We finish this trail at noon, sit on the ground in the rain to eat lunches from our backpacks, and then we shake hands all around and they're off to another trail.

"Look at that!" The backcountry ranger, Keny Slay, is surprised despite his experience. We're in a damp swale, and 10 or 15 feet on each side of this high-altitude trail has been ripped up as by a plow. The damage extends a good hundred yards.

"Hog," he says. "An old sow with piglets and probably some yearlings." They dig out succulent roots with tusks and snouts. Descendants of settlers' hogs and European boars once imported by hunting clubs, hogs are one of several exotic (nonnative) species damaging the park, and not the worst, either. Still, one hog can destroy an acre overnight, making marks that will last for years. They compete for the fall acorns on which bears depend; when the acorn crop is thin, hog pressure can starve bears. Slay finds tusk marks in the dirt and a snout print. "Big 'un," he says. "Look–she made herself a wallow. See?" Sure enough, the mud puddle takes the shape of a pig with tail, legs, head.

In the absence of predators, the hogs flourished. By 1986 they were overrunning the park. Eradication–killing or capturing for release in state hunting areas–

Hungry visitors lend a hand making hamburgers at the Chimneys picnic ground, a popular recreational site.

Traffic backs up on Cades Cove loop road. Last year more than 700,000 vehicles traveled this route.

eventually brought the population down to manageable levels. But the special funding that paid for it was exhausted in 1992. Left to themselves, the hogs can reach crisis levels in a mere two years, all the work undone. Yet Park Superintendent Randall Pope must cut into muscle elsewhere to find money for hog control. "We found a little, at least," he says with a worried frown. He's pressed on all sides.

Intrusions from outside are a major threat across the Park Service, from suburbs pressing borders to a landfill threatening bears by habituating them to human food to concession hotels and restaurants with their garbage and traffic problems. Unlike hogs, many other intrusions are beyond the park's capacity to control. Rainbow and brown trout planted in streams years ago are overwhelming native brook trout. Chestnut blight was deadly in the Smokies. A disease threatens the gorgeous dogwood, the gypsy moth is migrating southward and, in a major ecological tragedy, magnificent stands of Fraser fir have been destroyed by an invading European insect without natural predators here.

But the worst, the most pervasive, the hardest to counter, is that national crisis, air pollution, which sweeps up these slopes from as far away as Ohio and Louisiana, deposits pollutants in soil and streams and directly attacks trees. It has slashed visibility 60 percent in the past 40 years (80 percent in the summer months), a vital issue for a scenic park, and it has contributed to major damage to the forests.

The park, "a bull's-eye for acid rain coming in," as Jim Renfro, an air resources specialist running an air pollution study in the park, puts it, needs all the persuasive power it can muster. Over the past decade, drawing in part on Renfro's studies of plants in air chambers exposed to various levels of ozone pollution, the park has filed comments on many proposed projects in Tennessee it believed would injure its forests, but the state Air Pollution Control Board permitted them all. Renfro, who became part of Jeanne Renfro's love affair with the Smokies when they married, is hard at work to change such attitudes. He also is part of a movement across the Park Service to expand parks' scientific capacities.

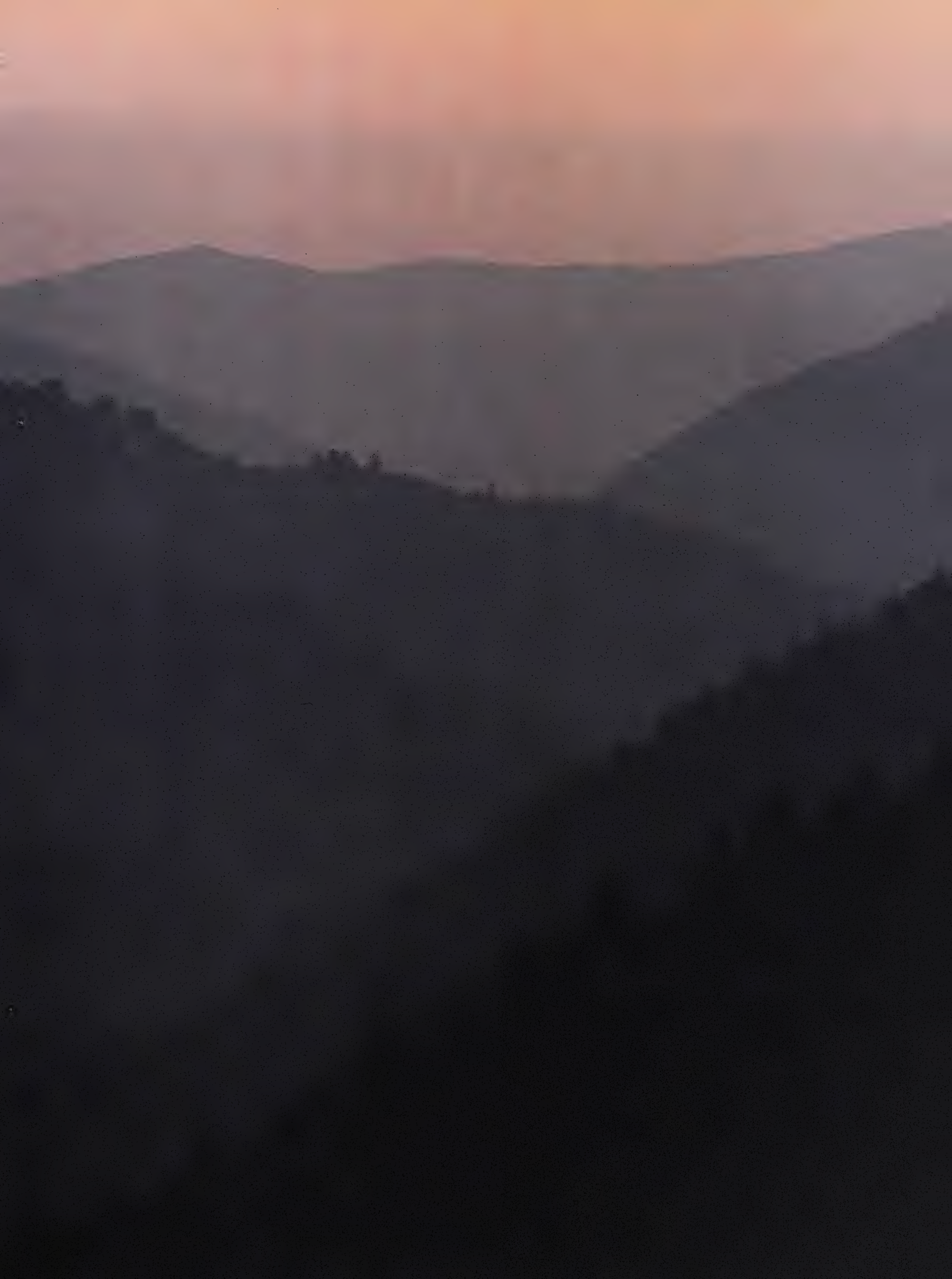
One conclusion of that extensive self-critique the Park Service made of its own problems was a determination that it should expand research at all levels, basic and applied. The applied side of that, at least, is being met in the Smokies by more than Renfro's project. Deep in a mature red spruce stand, Ellen Williams, a research assistant in the Cooperative Park Studies Unit of the University of Tennessee, is conducting a high-elevation watershed study that's designed to assess the effect of airborne nitrogen on a natural ecosystem. A project to restore the native brook trout involves electrically stunning all the trout in a stream segment, then moving the rainbows and browns to lower elevations. Red wolves have been released in hopes of restoring the park's one-time red wolf population. Peregrine falcons are back. Bear research projects are continuing.

Yet for all this, nothing so far has helped the Fraser firs. Going to Ellen Williams' watershed study, we walked among virgin red spruce where intermingled firs stood as dead hulls whitening in the sun. The Fraser fir is common in Canada. "This is by far its southernmost point," she says. "It's believed they came with the glaciers, and when the ice retreated they were well enough established at altitude to sustain themselves." Then the insect—the balsam woolly adelgid—arrived to attack the trees. Just the fir, not the spruce. The firs slowly died. Their presence had helped to support the spruce, providing windbreaks; now the spruce are suffering a secondary disaster.

One focus of Williams' watershed study is air pollution. "There's an argument that seems to have the ring of truth," she says, "that while the insect killed the firs, air pollution may have made them more vulnerable." Everything in the forest is related.

Later, on a high point, I walk into a dead fir forest. I stand there staring down into the valley through the meaningless sticks that once had been an ecological wonder. And then, close, carefully tied to a tiny spruce, I see a yellow ribbon. It's marking an experimental plot, but it strikes me that it could also be taken as a symbol of grief—or of hope. The symbol stands not just for this doomed forest but for the whole hard-pressed park and, indeed, for all these jewel-like parks that, in the preservation of the wild and of history, contribute so clearly to the public's sense of a shared national identity, and that are so obviously in crisis.

At sunset, a haze of pollution from coal-burning electricity generators obscures the mountain view.



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It may well be your worst fear.

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Our purpose in bringing to you the following information isn't to scare you, but merely to help prepare you.

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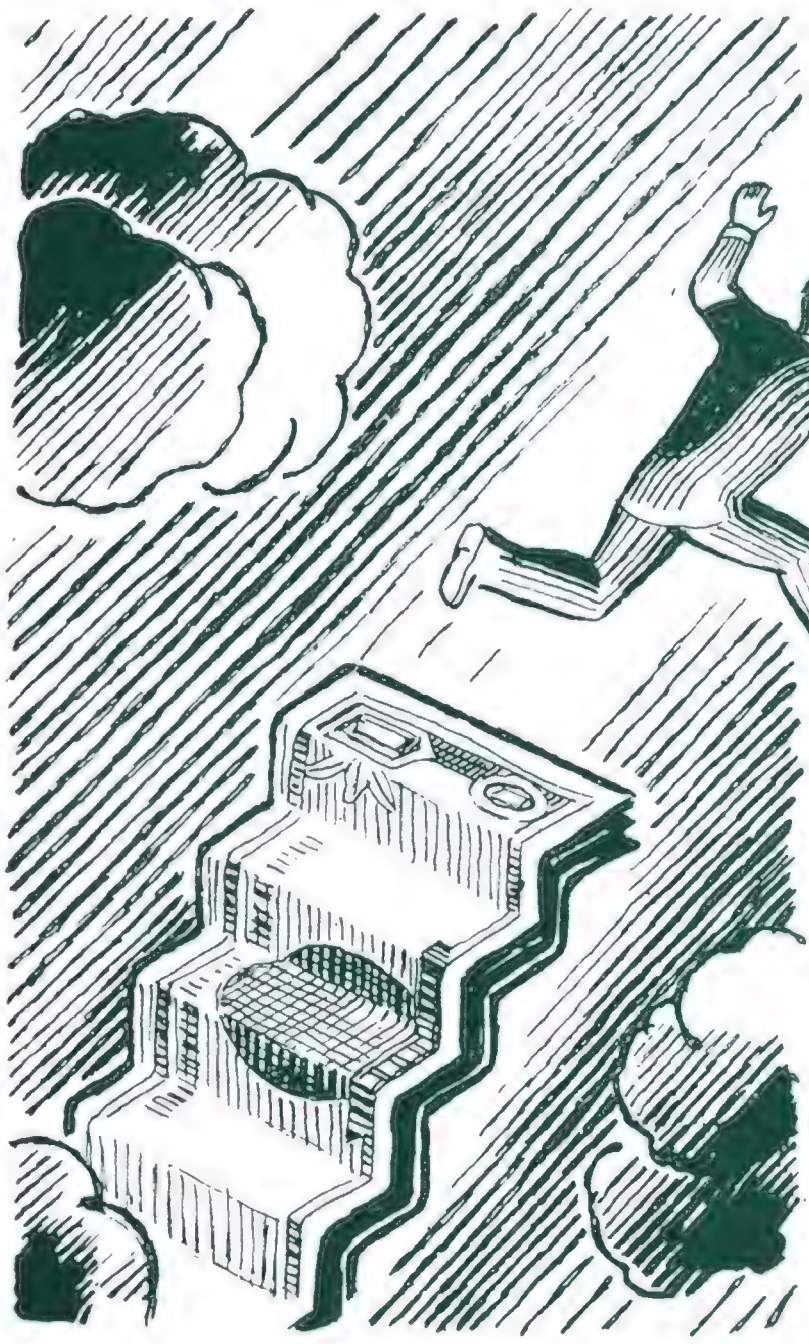

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Prudential Securities

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By Bruce Watson

Jaysho, moasi, dibeh, ayeshi, hasclishnih, beshlo, shush, gini

An unbreakable voice code, devised by an elite corps of Navajos in 1942, perplexed the Japanese and helped win the Pacific War

U.S. Marine Corps

Cloaked in secrecy and syntax, code machines were the pride of World War II cryptographers. State-of-the-art devices with cryptic names like "Enigma," "Purple" and "The Bomb," these black boxes used rotors and ratchets to shroud messages in a thick alphabet soup. But U.S. marines storming Pacific beaches used a different kind of code machine. Instead of rotors, each Marine Corps cryptograph had two arms, two legs, an M-1 rifle and a helmet. Their code name was *Dineh*–"The People." In English, they were called "Navajos."

As marines fought cave to cave on Iwo Jima, a foreign language crackled over field radios. Bombers were called *jaysho*–buzzards–and bombs were *ayeshi*–eggs. The commanding officer was *bihkehhe*–war chief–and each platoon was a *hasclishnih*–mud clan. On the morning of February 23, 1945, when six soldiers on a mountaintop hoisted the Stars and Stripes for all the world to see, the word went out in code: "*Naastsosi Thanzie Dibeh Shida Dahnestsa Tkin Shush Wollachee Moasi Lin Achi.*" Marine cryptographers translated the Navajo words for "*M*ouse *T*urkey *S*heep *U*ncle *R*am *I*ce *B*ear *A*nt *C*at *H*orse *I*ntestines," then told their fellow marines in English: the American flag flew over Mount Suribachi.

In most movies, the Navajos speak in a primitive pidgin and they still fight on horseback. But long after the West was won and lost, a group of Navajo patriots sharpened speech into a precise weapon and went to war for the nation that surrounded their own. They hit every Pacific beach from Guadalcanal to Okinawa, but their story is at best a footnote in war chronicles. They are the Navajo Code Talkers, and theirs is one of the few unbroken codes in military history.

More than 3,600 Navajos served in World War II but only 420 were Code Talkers. Members of all six Marine Corps divisions in the Asian-Pacific theater, they coded and decoded messages faster than any black box, baffling the Japanese with a hodgepodge of everyday Navajo and some 400 code words of their own devising. In early Pacific invasions their code was barely used by skeptical officers, but Marine commanders came to see it as "indispensable for the rapid transmission of classified dispatches." For three critical years, these Navajo polyglots proved that when it came to heroism, The People, too often known for their silence, spoke volumes.

Like all Americans of his generation, Keith Little remembers exactly where he was when he heard the news of Pearl Harbor (SMITHSONIAN, December 1991). Now a robust, rugged man in his 60s, Little recalls the boarding school on the reservation of Ganado, Arizona. He and his fellow students had some choice words for the cafeteria gruel, Little remembers. So on Sunday afternoon, December 7, "Me and a bunch of guys were out hunting rabbits with a .22. We had a rabbit cooking down in the wash, and somebody went to the dorm, came back and said, 'Hey, Pearl Harbor was bombed!' One of us asked, 'Where's Pearl Harbor?'

"'In Hawaii.'

"'Who did it?'

"'Japan.'

"'Why'd they do it?'

"'They hate Americans. They want to kill all Americans.'

"'Us, too?'

"'Yeah, us too.'

"Then and there, we all made a promise. We were, most of us, 15 or 16, I guess. We promised each other we'd go after the Japanese instead of hunting rabbits."

The next morning, the superintendent of the Navajo reservation looked out his office window. There stood dozens of ponytailed men in red bandanas, carrying hunting rifles, ready to fight. A year earlier the Navajo Tribal Council, taking cognizance of a world at war, had unanimously resolved to defend the United States against invasion. "There exists no purer concentration of Americanism than among the First Americans," the council declared. But the Navajo volunteers were sent home. No official call to arms had been issued, and besides, most of the men spoke only Navajo.

When the war broke out, Philip Johnston was a civil engineer with wire-rimmed glasses, a buttoned-down mind and a fluency in Navajo. The son of missionaries, Johnston grew up on the reservation. Reading about an

Ex-marine Johnnie Alfred of Tuba City, Arizona, holds Purple Heart for wound received in fight for Tarawa.

Bougainville, 1943: Cpl. Henry Bake (left) and Pfc. George Kirk use their Navajo code during jungle battle.

Photographs by Kenji Kawano

War and remembrance: Navajo Code Talkers

Bureau of Indian Affairs/Milton Snow Collection

Navajo volunteers are sworn into the U.S. Marine Corps at Fort Wingate, New Mexico, in October 1942.

Army test of Native American languages in combat maneuvers, Johnston had a mousetrap of an idea. During World War I, Indians in the American and Canadian armies had sent messages in their native languages. But lacking words like "machine gun" and "grenade," their use was limited. Early in 1942, when Johnston visited the Marine Corps' Camp Elliott, north of San Diego, he proposed an up-to-date code, guaranteed unbreakable. The Marines were skeptical at first, but Johnston returned with a few Navajo friends. For 15 minutes, while the iron jaws of Marine brass went slack, messages metamorphosed from English to Navajo and back. In April 1942, as the Japanese sent American prisoners on the Bataan Death March, Marine recruiters came to the land of "Changing Woman," the Navajo fertility goddess.

Though the Marines had been from the halls of Montezuma to the shores of Tripoli, they had never seen a place like the Navajo Nation. Scattered across the mile-high Southwest desert, fewer than 40,000 Navajos lived in a territory the size of West Virginia. The reservation had few paved roads, no electricity or plumbing, only a handful of schools. Nearly all Navajos herded sheep, lived in houses called hogans and bought what little they could not grow or make at the nearest trading post. Recruiters set up tables in the sagebrush and sandstone, called them enlistment offices and began looking for a few good men fluent in Navajo and English.

Fewer than 80 years had passed since the Navajo Nation had fought *against* the U.S. military. In 1864, following Kit Carson's scorched-earth campaign against them, a band of starving, ragged Navajos was marched 350 miles across New Mexico. Navajos call the relocation "The Long Walk." Though they returned four years later, the sad story was still being told when white men in uniform came seeking soldiers. President Franklin Roosevelt's Administration was then destroying Navajo sheep to reduce soil erosion and overgrazing. Why would men volunteer to fight for a nation that had humbled their ancestors, killed their herds and wouldn't even let them vote? (Voting rights for Navajos were restricted until 1948 in Arizona, 1953 in New Mexico and 1957 in Utah.) "Why do you have to go?" asked one mother. "It's not your war. It's the white man's war."

From nation to nation, soldiers enlist for reasons that lose nothing in translation, including jobs, adventure, family tradition and patriotism. "What happened to the Navajos in the past were social conflicts," explained Albert Smith, a soft-spoken, highly spiritual man who now serves as president of the Navajo Code Talkers' Association in Gallup, New Mexico. "But this conflict involved Mother Earth being dominated by foreign countries. It was our responsibility to defend her."

The Navajo creation story tells how The People emerged through a series of imperfect worlds. From a First World "black as wool" to a second, third and fourth realm, First Man and First Woman led Navajos to this world where beauty surrounds them. Not all the boys boarding the train for boot camp in San Diego believed the old story. Nevertheless, the Code Talkers, switching from hogans to Quonset huts, stood at the rim of one world looking into another.

Bruce Watson has written on everything from the Salem witch trials to bluegrass music to radio call-in shows. His latest effort was on the Luddites.

Code Talkers fought on Guadalcanal, Bougainville, Tarawa, Peleliu, Saipan, Okinawa and Iwo Jima.

Few had ever been off the reservation. They had met "Anglos" only on trading posts. Soon they would fight across an ocean they'd never seen, against an enemy they'd never met. So much mystery demanded ceremony, and recruits hired medicine men to perform a ritual called "The Blessing Way." The devout carried sacred corn pollen for protection. Unarmed but guarded by the ritual, 29 Navajos got their first glimpse of the Pacific and entered the world of drill instructors and *Semper Fi*.

Marines called the Navajos "Chief" and "Geronimo," and expected them to be eagle-eyed with a bow and arrow. But while the Navajos had long ago put aside bow and arrow, they proved to be model marines. Accustomed to walking miles each day in the high desert, they marched on with full packs after others balked and buckled. Only once did they falter. A drill instructor ordered his Chiefs to march in cadence to their language. But Navajo numbers lack the rhythm of "Hup, two, three, four," and the marchers added colloquial remarks about the D.I. The unit dissolved in disorder and hysterics. Toughened with the usual grit and gristle, the first group of Navajos became the 382d Platoon, USMC, and was ordered to make a code.

In 1942, it was mostly anthropologists and linguists who wrote Navajo. On the reservation the language was primarily oral, and the Code Talkers were told to keep it that way. There would be no code books, no cryptic algorithms. Navajo itself was puzzling enough. Germans deciphering English codes could tap common linguistic roots. Japanese eavesdropping on G.I.'s were often graduates of American universities. But Navajo, rooted in Athabaskan tongues probably brought across the land bridge from Asia, is a tonal language. Its vowels rise and fall, changing meaning with pitch. A single Navajo verb, containing its own subjects, objects and adverbs, can translate into an entire English sentence. In Navajo, one speaker noted, words "paint a picture in your mind."

To paint pictures at an exhibition of war, the Code Talkers turned not to math and machines but to nature. They named planes after birds: *gini*–chicken hawk (dive bomber); *neasjah*–owl (observation plane); *taschizzie*–swallow (torpedo plane). They named ships after fish: *lotso*–whale (battleship); *calo*–shark (destroyer); *beshlo*–iron fish (submarine). To spell out proper names, the Code Talkers made a Navajo bestiary, turning the Marines' *A*ble *B*aker *C*harlie into *Wollachee Shush Moasi* . . . *A*nt *B*ear *C*at. Finished with flora and fauna, they played word games. "District" became the Navajo words for "deer ice strict," and "belong" became "long bee." The enemy was christened by characteristic: Japanese–*Behnaalitsosie* (slant eyes); Hitler–*Daghailchiih* (Mustache Smeller); and Mussolini–*Adee'yaats'iin Tsoh* (Big Gourd Chin). Soon a message like "Jap sniper by fortification at Bloody Ridge" became: "Slant eye kill 'em all by cliff dwelling at *B*adger *L*amb *O*wl *O*nion *D*eer *Y*ucca *R*abbit *I*ce *D*og *G*oat *E*lk." Once the message was translated, some brave "One Silver Bar" (lieutenant) could lob a few "potatoes" (grenades) into the "cliff dwelling," sending the "kill 'em all" to the place "among devils" (a cemetery).

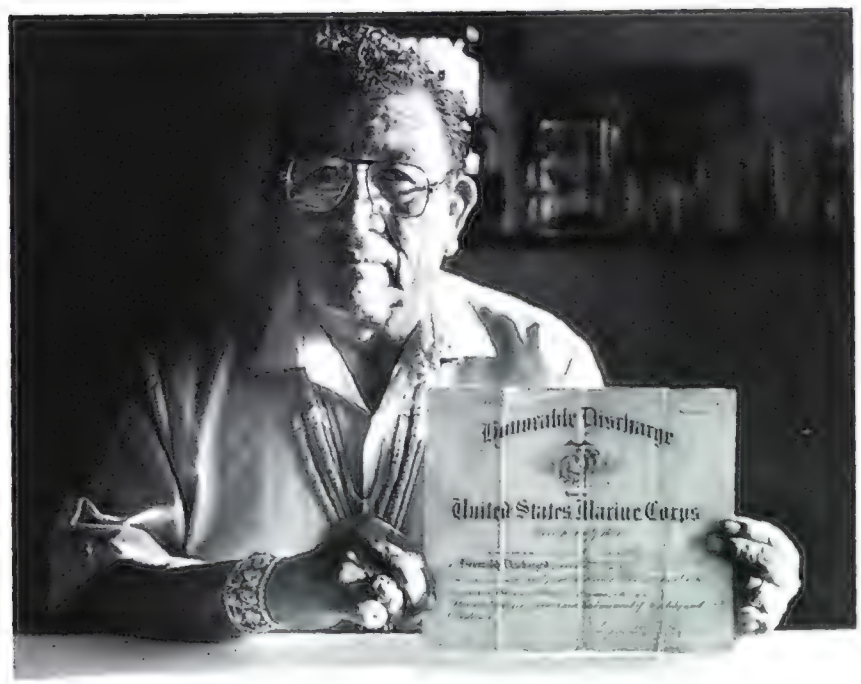
Instant coding and decoding–like magic

When the code was finished, Navy intelligence officers spent three weeks trying, and failing, to decipher a single message. New Navajo recruits untrained in the code could not break it. Yet it still seemed too simple to be trusted. Since 1940, U.S. intelligence had routinely intercepted and translated every message from the Japanese "Purple" code. The process, code-named "Magic," took hours. But these Indians were encoding and decoding sensitive military information almost instantly. What kind of magic was this?

"Well, in Navajo everything is in memory," said William McCabe, one of the code's designers. "From the songs, prayers, everything, it's all in memory. So we didn't have no trouble. That's the way we was raised up."

Two Code Talkers stayed behind to teach the next group. The rest were shipped overseas. The Navajo cosmology does not include a hell, but the Navajo recruits were about to enter one called Guadalcanal.

Assigned to four separate regiments on "the Canal," Code Talkers met skepticism in the flesh. One colonel agreed to use them only if they won a man-versus-



Dan Akee, holding up Honorable Discharge Certificate, still remembers the shock of seeing dead comrades.

James Nahkai, bearing flag for a Code Talker parade in New Mexico, served in the 1st Marine Division.

To get into the war, Albert Smith, president of the Code Talkers' Association, added two years to his age.

George Kirk (also shown on page 34) blends Marine and Navajo styles, including beads and a wrist bowguard.

machine test against a cylindrical gizmo that disguised words and broadcast in coded clicks. The Code Talkers won handily. When another officer gave them a trial on a common frequency, frantic Marine radio operators elsewhere on the island thought the Japanese were jamming the airwaves. After the lieutenant answered that the jabber came from fellow marines, the word came back: "What's going on over there at Division? You guys drunk?" Despite the Code Talkers' undeniable speed and mystifying language, officers were reluctant to trust lives to a code still untested in combat. Instead, the Code Talkers were used as everyday soldiers, fighting both the Japanese and the jungle.

For sons of the high desert, Guadalcanal, infested with leeches and crocodiles, drenched by torrential rains, recalled horrors from the Navajos' dark "First World." But, while ordinary marines survived on C-rations, the Code Talkers lived off the land, making stew from chickens picked off with a slingshot, hunting, skinning and dining on goats and horses. Other marines stumbled in the dark and recoiled from the wild terrain, but the Navajos proved adept night scouts and natural guerrilla fighters.

Back on the reservation, while medicine men performed rituals to protect sons overseas, Navajo instructors led by Sgt. Philip Johnston kept searching for the best and brightest volunteers. In boot camp, Keith Little was just another Chief, and few knew or cared from which tribe. Then a D.I. took him aside and asked, "By any chance, are you a Navajo?" Sent to Code Talkers' school, Little memorized 25 words a day. Tests weeded out about 5 percent of the recruits, who returned to regular duty. The rest were shipped to island infernos where the code had begun to convince the doubters.

An urgent plea: "Do you have a Navajo?"

On Rabaul, Code Talkers loaned to the Navy kept Japanese from learning of impending air attacks. On Saipan, an advancing American battalion was shelled from behind by "friendly fire." Desperate messages called "Hold your fire!" but the Japanese had imitated Marine broadcasts all day, and the mortar crews weren't sure what to believe. The shelling continued. Finally headquarters asked, "Do you have a Navajo?" A single Navajo sent the same message back to his buddy, and the shelling stopped.

"When you started sending messages and everything was correct, they started treating you like a king," Harold Foster recalled. "They'd say 'Chief, let me carry your radio for you. Let me carry your rifle for you.'" Code Talkers were given their own bodyguards, often to protect them from marines who couldn't tell a Navajo from a Japanese.

On Saipan, Samuel Holiday joined his buddies skinny-dipping in a shell hole filled with rainwater. He made the mistake of being the last man out of the pool. An MP saw the short, black-haired man wearing his birthday suit instead of a private's stripe. "I turned around and they had the bayonet right between my eyes," Holiday recalled. Marched back to camp, he became one of many Navajos glad to hear a familiar face call him "Chief."

Ethnicity fools soldiers but not bullets. Wading ashore in a hail of fire, two Code Talkers were killed on New Britain, three on Bougainville, one on Guam, another on Peleliu. The bodies came home but not the top secret. To conceal the code's origin, Code Talkers' letters home were not delivered. A year after their sons left the reservation, families still had no word from them. When an anxious Navajo superintendent asked Johnston about the recruits, the by-the-book sergeant couldn't contain his pride. They were involved in a secret code project, he wrote. Soon an article, "Navajo Indians at War," appeared in an Arizona magazine. After the Marines traced the source, Johnston was booted out of the Corps. Before he left, fearing the story would be forgotten, he took some Code Talker documents and later gave them to the Code Talkers' Association.

The special horrors of a corpse-strewn beach

As U.S. forces closed in on Japan, the word was that this new code could not be broken, not even when the Japanese captured an ordinary Navajo soldier. "They ordered him to translate," Code Talker James Nahkai recalled. "The poor guy couldn't do it. 'It's their own code,' he told the Japs. 'I don't understand.' This was in a POW camp back in Japan, in winter, and they stripped his clothes off and his feet froze to the ground."

Between invasions, Code Talkers convened to update the code. Then it was back to the beachheads. There may be no atheists in foxholes, but for a devout Navajo in battle, faith brought as much terror as comfort. Believing that the living can be harmed by the presence of the dead, unless protected by ceremony, some Code Talkers were especially horrified at seeing a corpse-strewn beach.

"We went right directly to the Marshall Islands first," remembered Dan Akee. "I saw some dead Japanese. And the Navajos usually fear that, you know. I tried not to glance at it, but I just couldn't help it. I just had to be among all those deads. That was one of the hardest things to get over."

The carnage of battle continues to haunt Code Talkers who can scarcely find words for what they saw. Asked "What did you do in the war, Daddy?" most World War II vets summon tales from the jungle of memory. But even 50 years later many Code Talkers respond with a deadly pause. Ask Sidney Bedoni, veteran of Guadalcanal, Saipan, Iwo Jima and Okinawa. "No. No. Uh, well, it really . . . I could tell a lot of stories about that, but I just don't . . . don't have the time to talk about it." Ask Lewis

William Dean Wilson was a sheepherder when he joined the U.S. Marine Corps at age 15. He served in the Pacific and in China, then later became a trial judge for the Navajo Nation. In 1983 he made a pilgrimage to the Iwo Jima Memorial.

Ayze, veteran of Saipan and Guam: "These stories I don't care to relate." George Kirk, survivor of ten Pacific bloodbaths, rummages through photographs in his Arizona home. One shows him a baby-faced rookie at the radio on Bougainville. Another taken only months later shows a war-weary veteran seated beside a helmet with a hole through the top. "Shrapnel," Kirk says. He doesn't say much more.

The Code Talkers have reason to be proud of their work on Iwo Jima, but their words paint mere impressions: "It just seemed like the island was burning early in the morning," one recalled. "This shelling was just coming down just like rain." Approaching "Iwo," a teardrop with a volcano on one end, most marines bowed their heads with the chaplain. Code Talkers sprinkled corn pollen and recalled their "Blessing Way" ritual.

George Kirk remembered, "Some of the guys didn't believe in a church, either Anglo or Navajo religion, but on Iwo Jima I heard them pray. I heard them cry."

Teddy Draper grew up at the site of a Navajo "day of infamy," a canyon where Spanish invaders slaughtered 125 Navajos in 1804. But not even the legends of Canyon del Muerto (Canyon of Death) prepared him for Iwo Jima. As Draper hit the beach, the tide washed back the dead. "There were a lot of machine guns going along all the way around Suribachi about 50 feet apart from the bottom to the top," he said. "Just flying shells, all over. You couldn't see." A shell tore through Draper's pants, just missing his leg. "And I thought, 'I don't know if I'm going to live or not.'"

Working around the clock during the first two days on Iwo, six networks of Code Talkers transmitted more than 800 messages without an error. In the monthlong battle, three Code Talkers were killed. But by the time their code spelled out "Mt. Suribachi," they had at last convinced all skeptics. Signal officer Maj. Howard Conner recalled, "Without the Navajos the Marines would never have taken Iwo Jima."

With human code machines churning out messages, the Marines went on to take Okinawa. Many Code Talkers were practicing street fighting, preparing for the invasion of Japan, when the war ended. "I kind of wanted to see Japan," George Kirk said. But the Navajos were headed home to their high country.

Decades after he exchanged his .22 for an M-1, Keith Little, a successful logger representing the National Inter-tribal Timber Council, visited Washington, D.C. and dropped by the Pentagon. The burly Iwo Jima veteran wandered the halls, looking at war photographs, searching for some mention of Navajos or Native Americans. "It finally hit home," Little remembered. "I realized we had lost our own country to foreigners and they were still getting all the recognition. Native Americans were getting nothing."

After the war some Code Talkers accompanied their divisions to China and stood on the Great Wall. In Japan, some saw the ashes of the atomic age at Nagasaki. But once back on the reservation, they were Indians again. Utah, Arizona and New Mexico still limited their voting rights. The government's livestock reduction plan had killed a third of all Navajo sheep, leaving the grass to grow, fertilized by resentment. Boys who had upped their ages to see the world and defend Mother Earth went back to high school. Others worked where they could, returned to their hogans and had nightmares.

When George Kirk began dreaming of enemy soldiers leaping into his foxhole, his wife sent him to a medicine man. "The Enemy Way," a three-day ceremonial slaying

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Code Talkers are now often asked to parade on ceremonial occasions. Here, they march down Constitution Avenue in Washington, D.C. Joe Kellwood (opposite) snaps to in front of a Marine emblem at Camp Pendleton, California, during Iwo Jima reunion.

of the "enemy presence," cured Kirk and many other Navajo veterans. Samuel Smith told his medicine man the whole story. "Now my son," the healer answered, "don't tell it no more to nobody, anywhere. That way you won't be bothered in the future."

The code remained top secret. Asked about the war, Code Talkers simply said, "I was a radioman." War movies and histories poured forth without mentioning them. But by linking The People to the world beyond the reservation, the Navajo vets had changed the Nation forever. A few remained in the Marines and fought in Korea and Vietnam, but the code was never used again. It was finally declassified in 1968. Only then did the secret come out.

The first Code Talker reunion in 1969 brought nationwide attention. In 1982, President Ronald Reagan named August 14 "National Navaho Code Talkers Day." Ten years later, Keith Little was invited to the Pentagon. There he translated a prayer for peace phoned in by a Code Talker in Arizona. Simple but efficient, the code still worked. Then Little and other Navajo vets helped dedicate a permanent exhibit on the Code Talkers.

Today a small, proud corps of silver-haired Code Talkers, as loyal to *Semper Fi* as they are to Navajo tradition, march in symbolic uniforms, wearing both turquoise beads and military medals. But mindful of Navajo caveats against glorifying war, most of the remaining few hundred avoid all ceremonies and parades. Only a handful will even discuss the war. "Talking about war contaminates the minds of those who should not hear about the bloodshed," explained Albert Smith. "There is always the danger of enticement for the young." So, like the stern photographs of young men in Marine uniforms framed in homes scattered across the sparse Navajo Nation, the Code Talkers are silent again.

Still their phones keep ringing, "a constant barrage," Smith said. History students seek details for dissertations. Hollywood wants a Native American Rambo. Already, a dime-store novel, *The Code Talkers*, tells of one Johnny Redhawk who leaves the reservation to become "America's secret weapon in the South Pacific." Keith Little shook his head. "Most of us are common men," he said. "We don't get in the front line and wave our arms. We know what we did and can tell it as it was without having to wave it on a TV screen."

But at the Window Rock Elementary School on the Arizona-New Mexico border, students are in search of a few good heroes. Children in the Navajo capital live in houses or trailers, often with a hogan out back beside the TV satellite dish. In school, young Navajos well versed in American pop culture learn Native Studies from teacher Isidore Begay. They read about the Navajo ascent through the four worlds. They study Changing Woman. And they read about the Code Talkers.

"Are they heroes?" Begay asks a fourth-grade class.

Students nod. "We could have lost the war," one says. "Then we'd be slaves to Japan."

Students send messages in Navajo code and find Iwo Jima on a map, trying to imagine how far the Code Talkers traveled. The chasm between countries and cultures has been closed by men who crossed the border between different traditions. In code, they spoke of snipers and fortifications, but their real message needed no interpreter. They spoke about surmounting stereotypes and vendettas for a higher cause. They spoke about blending tradition into the modern world. They spoke Navajo.

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By Joel Achenbach

Looking out for the bogey man on Texas' Tour 18

Combining pitfalls of great holes at places like Pinehurst and Pebble Beach, a new course near Houston can make strong men weep

Five golfers, each of whom can strike the ball brilliantly, are standing on the first tee at Tour 18, staring at the fake lighthouse straight down the fairway. The hole is supposed to look like the 18th at Harbour Town, the great course at Hilton Head, only there's no ocean along the left side of the fairway, just a swamp, because we're not in coastal South Carolina but rather suburban Houston, in what used to be an oilfield.

Two of the golfers have a personal bet between them. A thousand bucks a hole. Big money! The last time they did this, the better and thinner of the two was down $12,000 on the last hole, which happens to be modeled after the excessively liquid final hole at the Blue Monster course of Doral Country Club in Miami. Desperate, yet optimistic in the way that even the most inept golfer can be in critical moments, he put the entire $12,000 on the line, double or nothing. Golfers love to be bold. He stepped up and hit his drive directly, and perhaps inevitably, into the lake. Double bogey. Fill out the scorecard and write a check for $24,000.

So now they are facing each other again. "You and me, the same?" says the less talented and more massive golfer, the one who won the 24 grand. "You're on, big boy," says the better.

The massive one says he learned about high-stakes wagering from Dave Thomas, the Wendy's hamburger mogul you see on TV all the time. He quotes Thomas: "Get these guys out of their comfort zone. If you can't beat them with your game, beat them with your head."

It should be expected that golf inspires wagering because on most days it is only through gambling that you can leave the golf course triumphant, since the course itself cannot be mastered. Indeed, for the average golfer, the course cannot even be paid adequate homage. Golf is an absurdly difficult game. It appears to be played on a long course, some four miles from end to end, but in fact is decided microcosmically, down on the blade, where millimeters make a difference between a shot well struck and one that flops disconsolately ahead.

Par for the course is far from average

The phrase "par for the course" may connote averageness in normal discourse, but in golf it means you've played terrifically, if not quite at the level to go on the pro tour. A typical course has a par of 72 strokes, and most golfers can't break 90. (A reminder for all you baseball fans–bogey is one over par, birdie is one under.) Some of us have to calculate our scores with scientific notation, using powers of 10.

So now the better and thinner player stands over his ball, takes a couple of lovely, lubricious practice swings, stiffens, winds up and smacks the ball directly into the swamp. Bad show, laddie! (You have to think Scottish when you play.)

Illustrations by Wally Neibart

"I mean it was a chunk of sod so big that it looked like an alligator was jumping up out of the fairway."

The less talented, more massive player has an obvious opening, a thousand bucks staring at him right off the bat (if you will), and he quickly rainbows a ball into the woods, never to be seen again.

The three other players, who also have various wagers among them, take their turns.

Swamp.

Swamp.

Swamp.

Five fine golfers, five horrendous tee shots.

"Thank God for Mulligans," says the better player, teeing up again. A Mulligan is a freebie, a get-out-of-a-mess free card, definitely not something that exists in the rule book but common on golf courses everywhere because it is a hard game, and it is only fair that players have some limited power of erasure. They all hit magnificent second–uh, first–shots. The game is on.

The town of Humble, Texas, was the namesake of Humble Oil, which later became a division of Exxon. The town is now a suburb of Houston, the most sprawling and reckless of metropolises, a place where the most thriving industry seems to be billboarding. The oily roots of Humble are not washed away entirely; even as you whack the ball up and down the fairways of Tour 18 you will see occasional abandoned oil wells off in the woods, the steel contraptions looking like odd, oversize punctuation marks among the scrubby pines. (Golf and oil are also linked in the Texas panhandle–where they can't grow grass to make a green, they spray oil on the sand and play "pasture pool.")

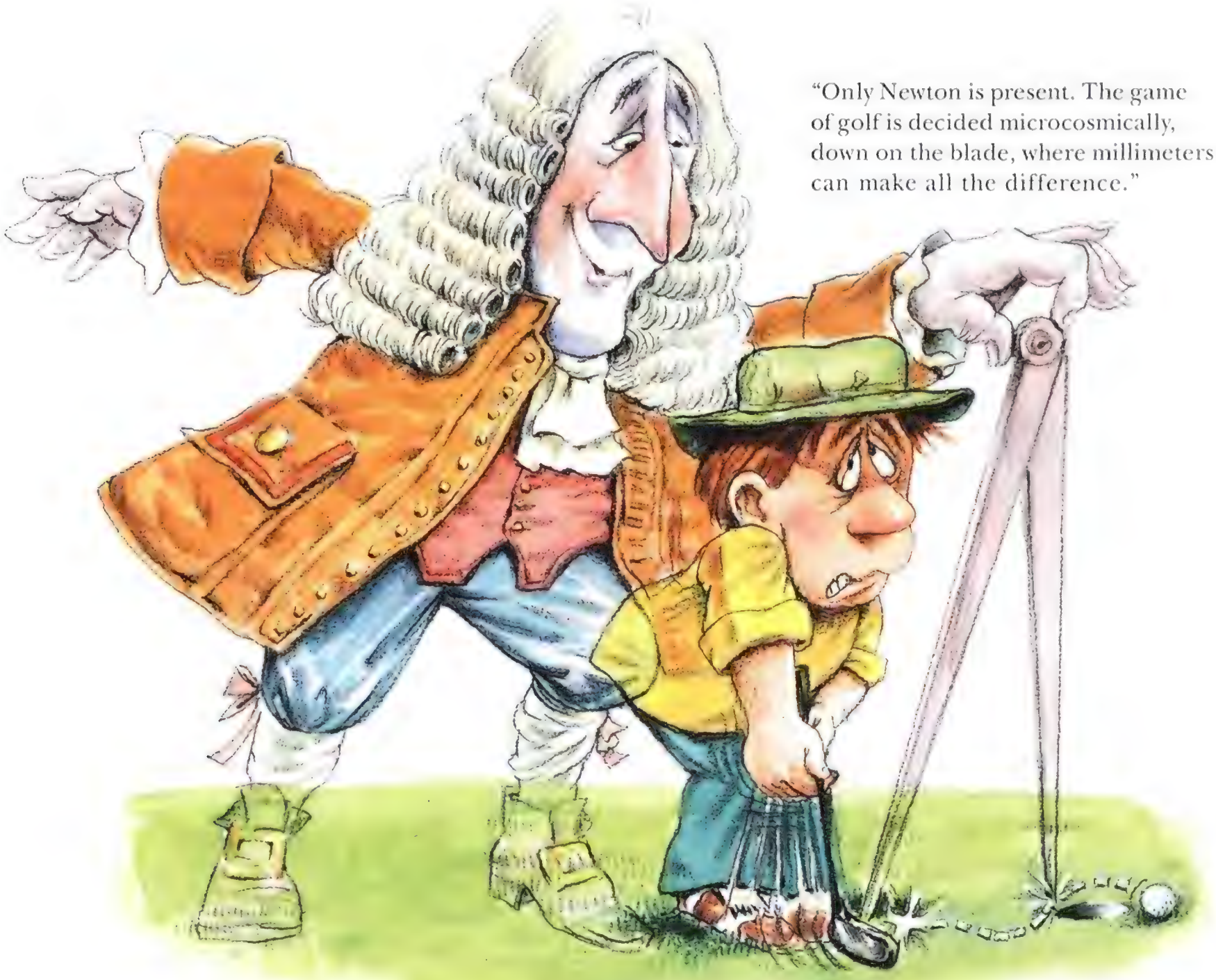
The 800 acres along the farm road east of Humble had been owned by Texaco. Wasn't much here but trees, bobcats, deer and armadillos. Dennis Wilkerson's family bought it a decade ago, thinking about developing it in the manner of so much of Houston, putting in roads and fire hydrants and sewers, the infrastructure of suburbia. But then disaster struck. "The real estate market went south, in '85 or '86. What we paid for the property here, it was probably worth half that," says Wilkerson, a tall, rangy man of 33 who'll put a dip of tobacco in his cheek before teeing off.

Where fantasy outscored glut

He and his golfing buddies, Barron Jacobson and Jim Williams, came up with an idea. Build a golf course. But there were already plenty of those, a veritable glut.

One day, playing the 18th hole at Doral–the real one–Wilkerson and Jacobson wondered if they could duplicate the hole. From there it was an easy jump to building an entire fantasy course–"America's Greatest Eighteen Holes," as Tour 18 is now subtitled.

For example, every golfer has a mental picture of the 12th hole at Augusta National, where the Masters tournament is played each April. The tee shot must sail 155


"Only Newton is present. The game of golf is decided microcosmically, down on the blade, where millimeters can make all the difference."

yards, cross famous Rae's Creek and a bunker, and settle onto a green that's barely a few strides from front to back. Beyond that is a high bank of azaleas. It's a beautiful and treacherous hole, a minimasterpiece set into a great course designed in part by Bobby Jones in 1930.

But even as the golfer envisions this sight, he has trouble putting himself into the frame. You can't even get a ticket to the Masters, much less play the course. It's private; you practically gotta be President Eisenhower to play there.

So the Houston fellows figured, if we can't go to Augusta, we'll make Augusta come to us. They re-created the 12th hole at Augusta, and the 11th and the 13th, for that matter–the entire "Amen Corner," as it is known in golfing circles. They used aerial photographs of the original and computer imagery and lots of bulldozing. A creek appeared, a bunker, a shallow green, a bank of hundreds of azaleas–though they still need to grow a bit.

Tour 18 also replicated holes from such golfer-worshiped courses as Pebble Beach, Colonial, Pinehurst, Inverness, Oakmont, Merion and Bay Hill. The result is a $6 million course that's a bit like the foreign pavilion section of Epcot Center, a place where you sample exotic locales even if it takes an awful lot of imagination to believe you're really there. You can play the 18th hole at Inverness where, in 1986, Bob Tway holed out from a green-side bunker to beat Greg Norman in the PGA Championship. You can play the hole at Disney World that has the bunker shaped like Mickey Mouse ears.

"There is a demand to get to play the courses we represent, and there is no chance that the average Joe like you and me will ever get on," says Jacobson, who now serves as marketing director and friend of visiting reporters.

Was it legal to do this? Is there a plagiarism question?

"There's no way to copyright or patent any kind of architecture," Jacobson says.

In newspaper columns and on radio, Joel Achenbach often tells readers and listeners Why Things Are. But why he slices off the tee remains a bitter mystery.

"Aficionados understand that the ball has a devilish aversion to the hole, a kind of reverse magnetism."

"That was the first money we spent, to get legal advice," says Wilkerson. "I don't think anybody's going to object to being honored."

Tour 18 is not a private course, so it doesn't have a paying membership, and at $75 for a weekend round of golf it's much pricier than most public courses, so it won't have too many regulars from the local population. Tourists, and the extent to which they buy the concept, will determine whether Tour 18 succeeds. The early signs are positive, though—good reviews from players and the press. Wilkerson is already talking about opening up a half-dozen more Tour 18s, with different arrays of holes, at other locations. Dallas will probably be next.

This course opened only last fall, so it's still a bit raw. The greens are slow. The winter fairways are not as green as they will be in summer. The lakes are artificially dyed, to make them blue instead of murky gray. And there's something dramatic missing on the Pebble Beach hole.

"You can't, obviously, bring in the Pacific Ocean," says the course's director of golf, Jeff Sheehan.

But these are minor flaws that may disappear with seasoning. The visitors I talked to seemed impressed and loved playing the course. If Tour 18 has a more general problem it is that it can never totally escape the inauthenticity that goes along with any kind of simulacrum. You need more than a protractor to re-create Augusta, Pebble Beach, Colonial; these places are not measured simply in spatial dimensions. Knowing that I'm hitting the ball toward a flag set in a green the same size as the 12th hole at Augusta, and that my ball drops into a creek that is precisely where the one is that guards that famous hole, does not remove the knowledge that I would probably never be allowed to play that club, to experience the real thing of being at Augusta. It would be neat to birdie the fake Augusta hole, but it would be something you'd tell your grandkids if you birdied the real one.

Golf, wretched game that it is, has the unfortunate attribute of being governed by physics rather than desire. The ball insists on going precisely where you hit it instead of where you meant to hit it. One feels betrayed.

The unhappy golfer will often invoke the presence of malign forces, but he or she knows the sickening truth, that only Newton is present, that every misfortune is due to old-fashioned 17th-century mechanical physics, with perhaps a dollop of chaos theory. Ultimately this is what makes golf so enduring a game—it is not a game of chance, no dice are rolled, and failure lies entirely with the individual, with his or her physical and psychological defectiveness. When I miss a crucial putt with two bucks on the line, I know the reason is not that I misread the grain of the green or put too much pace on the ball, but rather because I am, at core, a weak and silly man.

As a humility enforcer and great equalizer, golf is unmatched in sport. The grand master of golf stories, P. G. Wodehouse, said it best: "Men capable of governing empires fail to control a small, white ball, which presents no difficulties at all to others with one ounce more brain than a cuckoo-clock." Some golfers find the game so damnable that they are incited to outright despair, though I'd suggest to them that it would be far worse to be a professional. The pros, after all, are forced to perfect the most soulless of swings, to repeat them endlessly, thwacking the ball up and down fairways not just recreationally but mechanistically, their entire lives devoted to the maintenance of composure, pace and drab virtuosity.

When shots get creative, something's wrong

Bores is what they are. If you've ever seen a professional interviewed on TV, you've heard something like this:

"Eighteenth tee. You're up by a stroke. What were you thinking at that dramatic moment, Vince?"

"I was thinking 3-wood, Bob."

And that's about as deep as it gets. Professional golf requires the removal and suppression of ungainliness, whether physical or psychological. Creativity is necessary at certain moments, but it is generally to be avoided—if a player is making a creative shot, that means something has gone wrong. The best players simply drive straight to the heart of the fairway, put their second shot on the green with a short- or mid-iron, try to sink the putt for birdie or, as a last resort, tap in for par. Tom Kite recently won a five-day tournament with a score of 35 under par. More recently, Greg Norman birdied 10 out of 18 holes at the Blue Monster course and parred the rest—about as close as you get in golf to a perfect game.

The best pro golfers are only a smidgen better than the worst. "You look at the leading money-winner as compared to the guy who has to go back and get his

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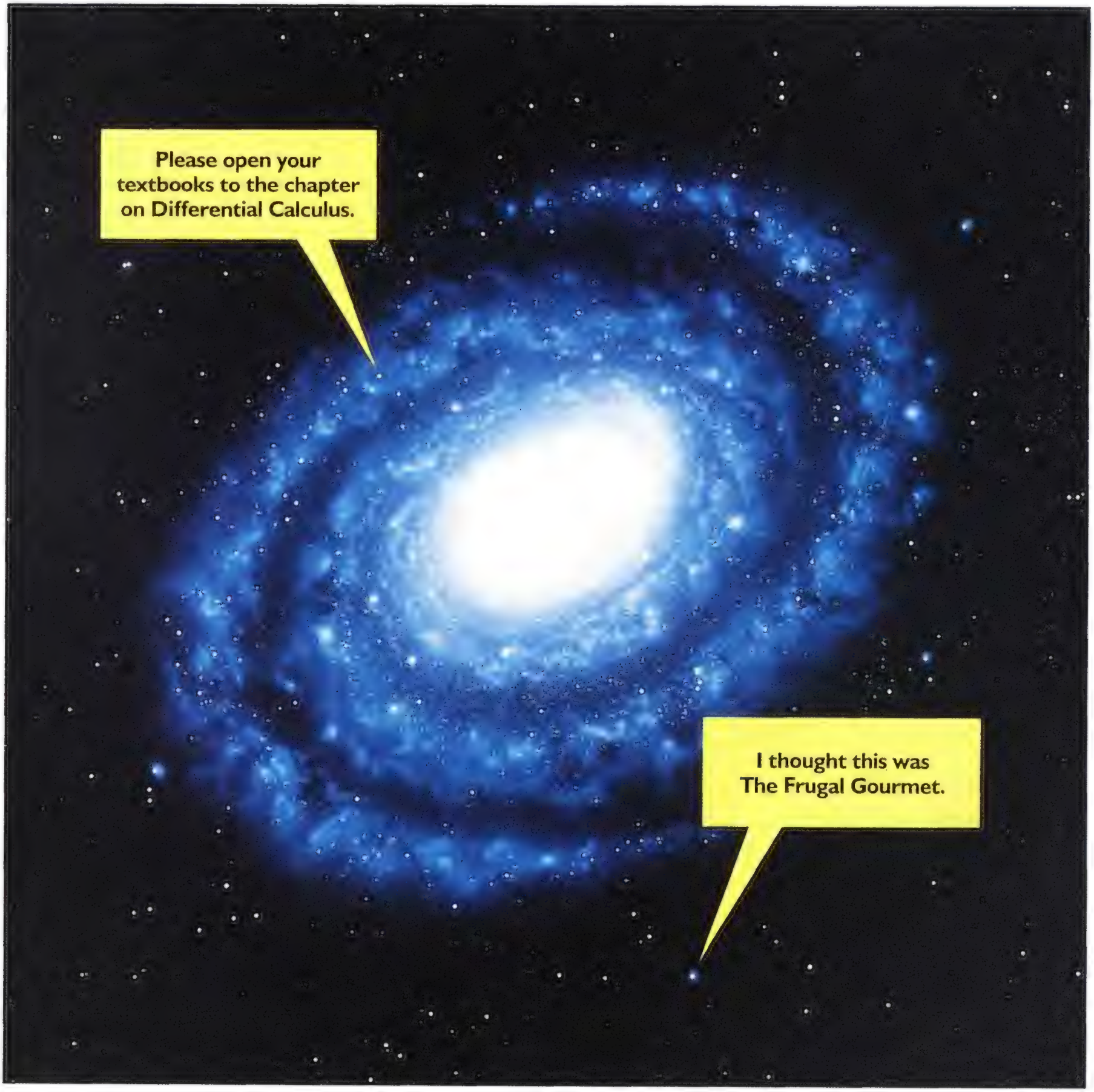

[tour] card, there's less than two shots," says Sheehan.

More interesting is the game played by real people in real life, the scratch handicappers at the top end and the duffers at the bottom. They understand that golf is a game played on the wrong fairway, from behind bushes, from deep woods; a game in which a ball does not always settle nicely onto a green but bounds over it; a game where there is no spectator's gallery to serve as a backboard for errant drives. (One reason the pros never get into too much trouble is that balls have an uncanny tendency to bounce off fans and back toward the fairway.)

The seduction of golf is that even a miserable player like me will occasionally hit a shot with results upon which even a Jack Nicklaus or a Nancy Lopez could not improve, and in such moments of physical prowess one realizes one's inner greatness. Until the next hole.

Intrepid reporter that I am, I had no choice but to play the Tour 18 course. I would have rather been in Washington, in the freezing rain of January, working at my desk job, but sometimes you have to make sacrifices.

You don't want to know what happened. The fact is, golf stories always enthrall the teller and stupefy the listener. They always go like this:

"So I'm lying two at this juncture and there's a pond between me and the green, and I'm thinking 9-iron, right? But Bud says don't be a priss, use the wedge. So I take the wedge and really lean into it, and I take a huge divot, I mean it was a chunk of sod so big it looked like an alligator was jumping up out of the fairway, and I get so distracted I never even see where my ball goes. So then we go up to the green, and we can't find my ball anywhere, but then Bud says lemme check the hole, and you'll never believe this but. . ."

Rule 1 of every golf story is that the ball ends up in the hole–amazing! The aficionado tolerates these stories only because he or she understands that the ball has a devilish aversion to the hole, a kind of reverse magnetism, though the aficionado would frankly prefer to be playing the game instead of listening to some other golfer gassing on and on. The nonplayer doesn't get these stories at all because they are jargon-strewn (bogey? eagle? divot? mashie? niblick? sclaff?) and the payoff is nothing but a number. What a pointless game! Even auto racing is more exciting because at least there's the occasional horrifying crash. Though I must say I have wrecked a vehicle while playing golf.

Here's the story: I'm on a course in North Carolina, about 200 yards from the tenth green, in the center of the fairway, thinking 3-wood. Wait, it gets better! There's this pickup truck parked just off the fairway on my left, about 30 yards ahead, and some workers are fixing up a bunker behind the truck. The only way I could possibly hit the truck is if I hook the ball, and I never hook, I'm a slicer and not a hooker, and–OK, so you know the rest of the story. You can almost hear the sound of the ball shattering the windshield, you can almost see the bare-chested foreman squinting at me, in my new golf shirt with the little golfer emblem over the left breast, and my new golf

"At Tour 18's No. 9, modeled after the 'island hole' at TPC Sawgrass, I'm wet, wet, wet again. So I drop one onto the green and play it out. A sextuple bogey?"

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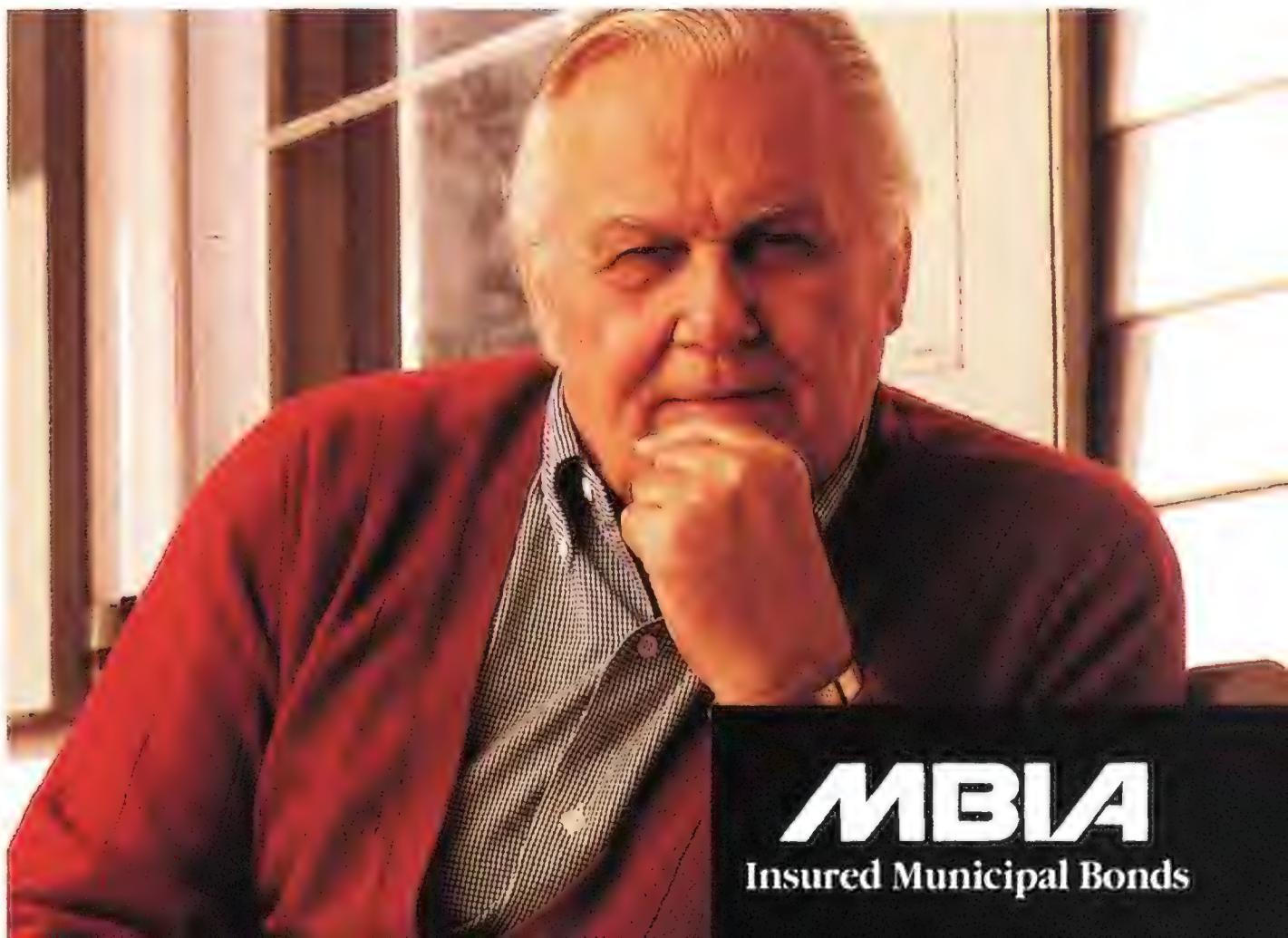

"Tee shots of such surpassing horror it was understood among us that they had, in fact, never happened."

gloves to protect my soft hands against nasty blisters.

"That's a mighty expensive round of golf," the foreman says. The workers stare at me like I'm a freak. I want to say Hey! I used to do landscaping too! As a teenager! The incredible thing is, I pull myself together and salvage a double bogey.

Rule 2 of every golf story is you end with the score.

The classic joke is about the guy who's playing golf with his wife and slices his tee shot into an adjacent barnyard. The wife points out that he can hit the ball back through the barn onto the fairway. He tries this but the ball ricochets off a rafter, hits his wife in the head and kills her. Several years later the guy is playing the same hole with a pal, and once again he slices into the barnyard. The pal says, "You can get back to the fairway if you hit it through the barn." The first guy says, "Nah, the last time I tried that I bogeyed this hole."

So I was about to say what happened when I played Tour 18. Let me summarize by saying that I improved over time. That's the wonderful thing about starting with three triple bogeys. (The best defense against decline, in my book, is a consistent mediocrity.)

Luckily I had great playing partners. Dave Edgerton and John Goddard, ages 43 and 44 respectively, were all set to go off the first tee as a twosome when I ambushed them with a request to join. They turned out to be extremely authentic golfers. They were even insurance salesmen, of all perfect things.

I asked them why they liked the game. "It's not a team game. It's an individual challenge," said John. "It's you against the elements," said Dave.

Warriors. That's what they seemed like. Far from home, which happens to be Canada, armed for battle against this mysterious new golf course, turning bright pink in the Texas sun.

The first highlight of the round came on the second hole. It's modeled after the sixth hole at Arnold Palmer's Bay Hill course in Orlando. The hole is crescent-shaped, bending around a lake, and five strokes are conceded to par. The nefarious quality of the hole is that there is temptation to flirt with the water on the left in order to cut some of the distance off the journey to the green. Dave chose to romance that fine margin and dropped two into the drink. John is a lefty and used his natural right-to-left fade to delicately follow the shore, putting him close enough to go for the green on his next shot.

Then came my turn. I would play it safe, naturally. Up the middle. I vowed to take a relaxed swing. My hips shimmied slightly. I was light on my feet. Not a tense muscle anywhere in my body. As the club head reached its zenith, a kind of spasm grabbed my body: I found myself leaning forward and back, the club looping and gamboling through the air until there sounded a small, sickening *click*, and the ball, barely nipped by the heel of the club, casually flicked itself past my left leg–possibly between my legs, though it happened too fast to see–and rolled lazily into the lake a few yards behind me, a tee shot of such surpassing horror that it was instantly understood among the three of us that it would be not be remarked upon, that, indeed, it never happened.

Such decent chaps, Dave and John.

Four holes later, I was staring at the frightening 12th hole from Augusta. The dynamics of the course are such that there's always a backup here, a line of golfers waiting to tee off, and so I had the pleasure of stepping into the tee box with a full gallery of onlookers. Since golf is a psychological game, I did what all smart golfers do. I pictured myself making a perfect shot, parachuting the ball onto the green a few feet from the hole. But this struck me as science fiction, so I pictured myself not missing the ball completely or accidentally whacking myself in the leg. It worked. I hit a lovely shot that did, yes, go into the creek, but it was pretty during the airborne portion. Finally, I dropped a ball and promptly hit a screaming worm-burner that bounced across the green with such velocity I feared I might have killed one of the azaleas. I finished the hole one stroke below the square of par.

There were other misadventures in the round–I use a special brand of golf ball called Lakefinder–but what I will most remember is the ninth hole. It is based on the "island hole" at TPC Sawgrass, the course where the pros play the Players Championship, which some call the "fifth major" (after the Masters, the U.S. Open, the British Open and the PGA Championship). The hole at Tour 18 is not quite as visually intimidating as the real

"Even on a fantasy course it's the same old betrayal, the same humiliation. Golf is indeed a wretched game."

thing–the lake surrounding it is not quite so vast–and the green is in fact slightly broader, the result of a miscalculation during construction. But it still gives your psyche a workout. The ball has to carry about 120 yards of water and then plop down onto a green.

My first shot was just the right distance but a foot to the left. Wet.

My second shot struck the green near the hole and bounded over the back. Wet.

My third shot landed on the left edge of the green, and we all agreed that I was in fine shape, an agreement that was in fact a convenient delusion, since my ball clearly had trickled off the back. Wet again. But at some point you have to walk up there, drop one onto the green and play out. I got a nine. I'm not sure what you call that. Sextuple bogey?

Dave and John's personal battle was nip and tuck. They play often in Canada and know each other's game. This is Dave's first golf trip, but John has made several, including one to Myrtle Beach, him and 30 guys, nothing but guys. But Dave is the more prodigious golfer; he once played 54 holes in a single day, shot 83, 84, 83.

Why play so much?

"I'm only going to live once," Dave said.

In other words, you can't just waste your life working and raising a family. You have to have *priorities*.

One thing I noticed while playing with them is that Dave and John never discuss anything on the golf course except golf. One of the great lies of the world is that golf is a sport where businesspeople cut deals. That, in fact, was one reason given by women for why country clubs should end their all-male policies. To have equal clout in the world of business, the women said, women needed to be able to get inside the commerce of the golf course. The truth is that men have merely pretended that they were accomplishing something when they played golf. Business deals? This is what you hear on a golf course:

"You crushed it, Dave."

"Good-looking ball, John. Right-hand side, just on the edge. Good poke off the tee. That had to go about 270."

"That's all that matters, Dave, that you look marvelous swinging the big stick."

Dave finished with a 90, John with a 92. Dave won $1.50. Gambling is illegal, yes–hence the anonymity of the high-stakes players at the start of this article–but Dave and John are Canadians, let's remember. We'll just regard them as being fugitives at this point.

I'm not sure what they ended up doing the rest of the week, but one of the last things that Dave said, turning to John, was, "Let's go over to Vegas, golf in the day, do the casino, do some gambling, come back the next day."

As for me, before I left Houston I managed to par that damnable island hole. Because I am an incredible athlete and human being.

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By Peter Carroll

Ralph Fasanella limns the story of the workingman

Through an innovative effort, his paintings, which depict the struggles and pleasures of labor, can now be seen around the country

A dyed-in-the-wool New Yorker, Fasanella savors straight talk with his coffee; *Family Supper* (opposite) hangs in the Ellis Island Immigration Museum.

On a warm spring day in New York in May 1991, five hundred art-loving dignitaries and ordinary citizens clambered aboard a ferry at the foot of Manhattan and sailed past the Statue of Liberty to the new Ellis Island museum. There, in the historic Great Hall, where millions of foreigners first set their feet on terra firma in the United States, the entourage witnessed the formal installation of a humble, haunting painting commemorating the immigrant experience. "I became the immigrant again," said the artist Ralph Fasanella in presenting *Family Supper*, a 70-inch-by-50-inch oil canvas, to the American people. As schoolchildren sang Woody Guthrie's "This Land is Your Land," spectators applauded not only the painter but the historical traditions he represents. The occasion also celebrated an imaginative approach to the exhibition of art. An organization called Public Domain has helped to place nearly 20 of his works where they can be seen—from museums and libraries to a Congressional hearing room and, soon, even a subway stop.

Fasanella's reputation is growing. As Lynda Roscoe Hartigan, a curator at the Smithsonian's National Museum of American Art (NMAA), says, "Ralph Fasanella is an accomplished artist whose vivid, detailed paintings always challenge our conscience and imagination."

And yet Fasanella's entry into the art world happened almost by chance only 21 years ago. A sharp-eyed collector, intrigued by one of his big, bright effervescent "folk" paintings in a group show, was fascinated to discover that its creator was a self-taught, 58-year-old service station attendant. He tipped off a reporter, and the resulting article splashed Fasanella's face on the cover of *New York* magazine. "This man pumps gas in the Bronx for a living," the headline exclaimed. "He may also be the best primitive painter since Grandma Moses."

Fasanella personified the workingman stereotype. Short and stout and earthy, he was a grade school dropout who spoke with wisdom and humor in the idiom of the street. Yet his paintings revealed a poetic spirit and an unvarnished joy in the pleasures of everyday life. If art, as the philosopher John Dewey stated, accentuates what is valuable in ordinary experience, Fasanella's 150 large canvases extolled the natural beauty of urban life in America.

Since 1944, the artist had struggled in obscurity to master his craft, laboring patiently, obsessively, to capture the soul of working-class life in America. Despite a sprinkling of exhibitions over the years, Fasanella had sold only two significant paintings. But after the article appeared that autumn, Fasanella's solitary passion became, overnight, his profession. A show at Automation House in New York City drew a thousand spectators a day, and his canvases found patrons by the carload. For the first time, Fasanella heard the praise of critics and customers, and he began to imagine a career outside the gas station.

Fasanella had seldom traveled far from his roots in Greenwich Village, where he was born, appropriately, on Labor Day 1914. His parents, both natives of Bari, a province in Southern Italy, had met and married in the city of immigrants. Joe Fasanella, the painter's father,

Ellis Island Immigration Museum

Collection of Mr. and Mrs. Ralph Fasanella

Subway Riders (1950) grew out of sketches the artist drew on his newspaper while he rode to and from work.

"I got to know the people on the train," he says. "I did drawings of all of them–they got a big charge."

delivered ice from his horse-drawn wagon; his mother, Ginevra, bore and raised six children while working as a buttonhole maker in a coat factory. Their struggle would become the meat and potatoes of their son's art.

Family Supper, one of his most moving paintings, was completed just before his rise to fame in 1972. It is a bittersweet reminiscence of the artist's early life, expressing the pride and the anguish of an immigrant family battling to preserve its heritage amid the daily struggle of earning a living. "It brought back the image of my mother, the working woman," remarks Fasanella. "It gave me the sense of a family tradition." He recalls the cleanliness and order of his mother's kitchen, the warmth that came from the gas stove (fed by quarters in the gas meter on the back wall), his mother's uncomplaining efficiency as she prepared breakfast before she left for work. "She had no time to become neurotic," he asserts. Yet there is no sentimental nostalgia in the scene. On one wall hangs the portrait within the painting of the artist's father, crucified by the ice tongs that symbolized his working life. "The good old days," says Fasanella ironically; "I know the hardship besides." The motto etched on the red bricks of the tenement wall proclaims the driving force of all his art: "Lest We Forget."

Fasanella's earliest works were plainly autobiographical. A tough street kid who knocked around the sidewalks of New York, he acquired a pedestrian's-eye view of the urban landscape. Massive buildings dwarf the multitudes that populate his paintings. But Fasanella's city is a happy place. It breathes vitality and motion–from the omnipresent stickball diamonds chalked on the asphalt to the unique interior decorations that peek through the open windows. "I don't reject the slums," Fasanella explains. "I take the best out of them. They are not nega-

The Museum of American Folk Art is acquiring this work and will exhibit it in a Manhattan subway station.

tive views." Nor are the city dwellers anonymous. "This guy here," the painter says, pointing to a newspaper vendor in a recent painting, "I used to see him every day. And this one is an old buddy, and this one," he taps a portly figure in the foreground, "is me."

Fasanella's love of the city and its feisty inhabitants reflects his intimate connections to the immigrant worker's experience. Just before the Depression he was in and out of reform school several times; in his late teens, he got involved in the burgeoning labor union movement, which defined his life's work. "I never did a painting for myself," he says. "I was always trying to uplift other people, to show them who they are and where they came from." As Fasanella participated in unemployment demonstrations, served a stint as a truckdriver in the Spanish Civil War, and eventually settled down as a union organizer in New York, he gained a point of view that later would give his art a unique edge. "My job is not only to record American history," he declares, "but to record the feelings of American workers as honestly as possible."

"The thing that comes through," observes Gerard C. Wertkin, director of the Museum of American Folk Art in New York, "is his commitment, his passion, for what is right. Fasanella is not just offering a personal vision. He is committed to recognizing the place of labor in American history." This commitment distinguishes Fasanella's art from that of so-called "primitive" painters and "outsider" artists. "A lot of people in the art world do not realize how integrated Fasanella's work is with the labor community," remarks NMAA curatorial associate Andrew Connors. "His paintings about labor and injustice portray the struggle of powerless people to change their situations. His work shows a deep understanding of contemporary social issues."

For Fasanella, art and labor were thoroughly intertwined from the beginning. Near the end of World War II, before he ever considered painting, he was involved in unionizing electrical workers when he began to experience a curious itching and aching in his fingers. "I thought I had arthritis," he says. To ease the discomfort, he would rub his hands across tabletops or the surface of newspapers. One day a colleague handed Fasanella a soft pencil and a pad and suggested he try sketching. Within minutes, he had managed his first drawing. Soon Fasanella was copying everything in sight. Finally, he had to admit that he was more interested in drawing his fellow workers than in organizing them. Yet when he attended an art class, he felt so out of place that he walked out and never went back.

So began the education of the artist. He dabbled with watercolors and poster paints until he got the nerve to stretch some canvas and dip his brushes in oil. "I put the paint on directly," he told an interviewer in 1972. "I just did it. Just put it on." Those early works–a lonely subway kiosk in New York's Sheridan Square, the interior of his Greenwich Village apartment, the street he was born on–belie a "primitive" style and a decorative intent. But obsession overcame Fasanella's inexperience. He began to paint regularly, constantly, breaking off only to sleep or to go to the Whitney Museum or the Museum of Modern Art, where he could scrutinize the masters and endeavor to learn the principles of organization and unity. Much of the art confused him. "You've got to be an intellectual to understand," Fasanella remarks of Picasso's *Guernica*. "The guy in the street will never understand it."

He followed his own visions. "I worked and I painted, and I painted and I worked," he says, "and the world

Peter Carroll, who is a historian and lecturer at Stanford University, is writing a book about Americans who fought in the Spanish Civil War.

Overleaf: *May Day* (1947)

Collection of Mr. and Mrs. Harold Sampson, Milwaukee

UNITED
XXX

Committee on Education and Labor, U.S. House of Representatives

The Great Strike–Lawrence 1912 (detail) chronicles Massachusetts strike that resulted in a union victory.

owes you nothing." To support himself, Fasanella took temporary jobs, relied on his brothers and sisters and his wife Eva, whom he married in 1950. Eva became the bulwark of his private life and, later, his business manager.

To encompass his grandiose views, Fasanella turned instinctively to large canvases. The 50-inch-by-80-inch *May Day* (pp. 62-63) took six sleepless months to complete, but its subject extends from the diverse heritage of American workers–white and black, immigrant and native-born–to a utopian future where honest labor is rewarded with ample recreation and unencumbered delight. The workers' militant slogans–"Fight for Peace, Democracy, Security"–are matched with the patriotic iconography of Jefferson, Lincoln, Frederick Douglass and Franklin Delano Roosevelt. "Americanism is what it's all about," says Fasanella.

At first glance, the story seems simple. But to focus only on the social message is to obscure Fasanella's subtle genius. For the painting exudes a feeling of warmth and playfulness. The eye follows the labor parade past the crowded buildings toward the gates of Eden; the throng gives way to paradise. "It's the form that gets them," Fasanella exclaims, "then the content. The inner feelings, the color, the design, pull people into the painting. And then they see the inner story. My paintings look easy, but they're very complicated. That's why they're so big; that's why people like them."

"Everyone is alone but very much together"

He calls it "monumental simplicity." The paintings are accessible, inviting and fresh. "Here I show the subway riders at night after a hard day's work," Fasanella observes of *Subway Riders*, completed more than 40 years ago. "Everyone is separate, alone, but very much together. It's noisy with the creaks and squeals of the wheels, but peaceful too because we move to a rhythm and cadence that gets inside us; that's comforting, like the noise of the city itself."

So Fasanella painted for more than two decades: a day at the gas station, home for dinner, conversation with his wife and two children, a nap–and then the creative work extending through the dark hours of night. His output was prodigious; his subjects explored the richness of working people's culture. He portrayed baseball games and union meetings; political rallies and election campaigns. *American Tragedy*, a combining of story and symbol, articulated the grief and suspicion surrounding the assassination of President Kennedy. "What a challenge to paint the big story," he declares. "Somebody's got to tell the people what's going on. I don't run away from it."

Fasanella's rapid ascent in the early '70s nonetheless challenged his creative imagination. After the news stories and the exhibition and an elegant coffee-table book (*Fasanella's City* by Patrick Watson), the artist still had to

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Collection of Mr. and Mrs. Donald Mostrando, Ossining, New York

Night Game–'Tis a Bunt (1981) catches the contented feel of a ball game played under the lights. Fasanella grew up playing stickball and loved nothing more than a pickup street game played on a Sunday afternoon.

face his daily foe–the empty canvas–and he no longer had the excuse of running the gas station. "It was dead as a doornail," he recalls, "and I was bored stiff. I had to get a new vision." On impulse, he decided in 1975 to head for Boston, which he remembered fondly from his organizing days; but just before he departed, a friend suggested he first visit the old mill city, Lawrence, Massachusetts, birthplace of America's industrial revolution.

For Fasanella, that little detour to Lawrence proved to be the shortest way home. For the next three years, he rented a room at the YMCA for $18 a week, commuted to his family in New York on weekends, and systematically immersed himself in the history and culture of one of the most dramatic labor movements in this century, the "Bread and Roses" textile strike of 1912. He haunted the public library, studying old newspapers and books and examining drawings of mill life by Winslow Homer. He roamed the streets like a pilgrim, fondling the old red bricks at the mills, chatting with factory workers at the gate, exploring the ethnic traditions of the Italians, French Canadians and Greeks, who had been not only clothed but also fed by New England textiles. He even persuaded the mill owners in nearby Lowell to allow him inside so he could draw the massive pulleys and gears and the machinery that tugged the soft tufts of cotton and wool into threads and yarn and fabric.

"I had to live like a monk," says Fasanella of his lonely sojourn, "and I had to be in a state of grace." And then he began to paint. The result, a series of 18 canvases, is a veritable history of the American immigrant labor experience, told with the accuracy and detail of a historian. The newspaper headlines are precise; the mini-anecdotes that compose the paintings–for example, the "pots and pans brigade" of the women workers, the mounted

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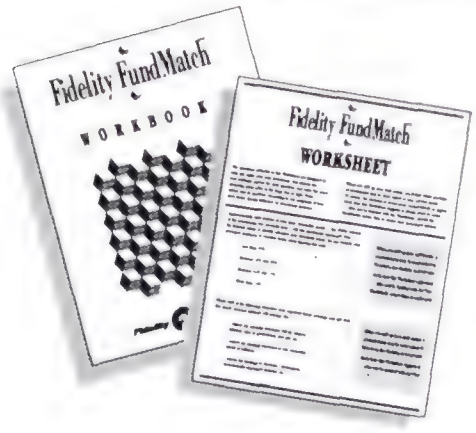

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policeman in the foreground pummeling a child–are authentic. But Fasanella strove, too, to infuse his story with compassion for the ordinary worker who came to Lawrence to fulfill the American dream. "This is what really happened," Fasanella explains.

The Lawrence series brought the artist to maturity. He had moved beyond personal recollections and nostalgia; he had escaped the limits of New York. "Lawrence introduced me to the variety of the labor experience," Fasanella declares. "I learned about the machinery, the different people, the role of women." He also acquired a fresh self-confidence. Back in New York, he focused on his favorite pastime and produced a series of canvases, including *Night Game–Yankee Stadium* and *Night Game–'Tis a Bunt*, that depict the drama of the game and highlight the vitality of the fans. "People keep wanting to pin it down to a time and a place," he says of these works. "Is it Yankee Stadium, is it Fenway Park, is it Ted Williams, is it Willie Mays, is it Casey Stengel? The answer is yes."

Fasanella's populist instincts would soon lead to a remarkable experiment in public art. One day, Eva Fasanella mentioned to a Massachusetts union organizer named Ron Carver that her husband had been offered six figures for one of his paintings of the Bread and Roses strike. The labor leader was aghast. "I realized that most of his great paintings were owned by private collectors," Carver remembers. "They represented the spiritual heritage of the labor movement. They belonged in the public domain. My position was transparently absurd. I told Ralph not to sell it."

While Fasanella listened skeptically, Carver outlined a proposal to raise funds to purchase the painting and donate it to a museum. With the help of local politicians, newspaper editorials and several sympathetic labor unions, the coffers began to fill. "I undertook that in 1988 when I was working to save a plant from shutting down," Carver recalls. "It was a good year. We saved the plant and we saved the painting." *Lawrence 1912: The Bread and Roses Strike* hangs today in the Heritage State Park Visitors Center in Lawrence, Massachusetts.

Bringing the paintings into public view

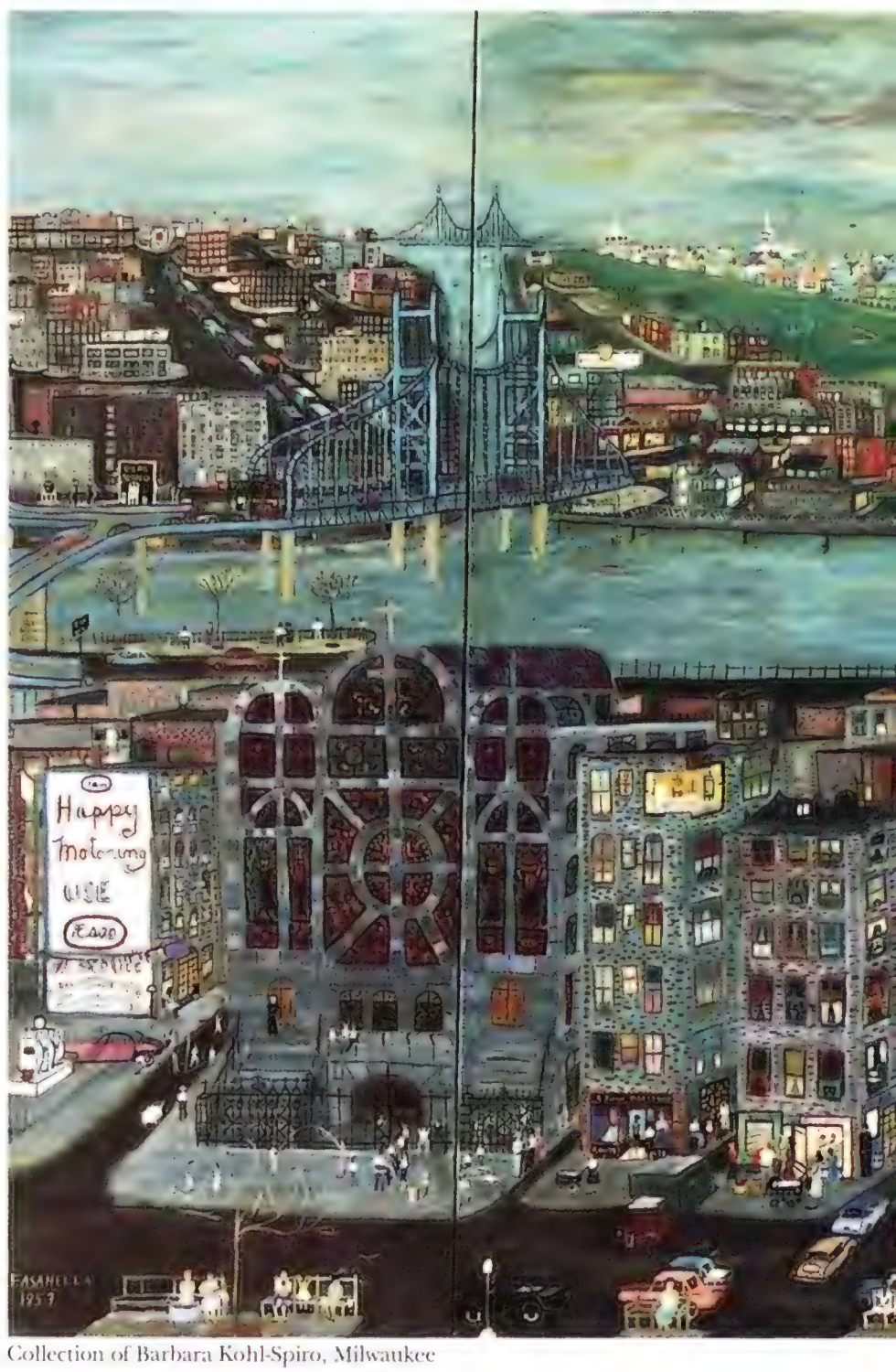
That success inspired Carver to create Public Domain, a nonprofit organization dedicated to bringing other Fasanella paintings into public arenas. "It was absolutely wrong that the man's greatest paintings should be hidden away in the living rooms of wealthy folks," Carver asserts, "and the people whose heritage they celebrate would have no access to them." To broaden his appeal, Carver persuaded schoolteachers to include labor history in the curriculum and invite the artist into the classroom to explain the purposes of his art. Fasanella proved an adept instructor; his unpretentious style, recently captured on video in Glen Pearcy's award-winning *Fasanella*, appealed to streetwise students. "He's one of us!" exclaimed a surprised 15-year-old African-American at Oakland Tech High School in California.

Public Domain printed and sold almost 50,000 color posters to raise money so that his paintings could be purchased and put in public spaces. "It is entirely unique," says Museum of American Folk Art director Wertkin, with admiration. "Ron Carver is involved in an extraordinary crusade to assure that the contributions of organized labor not be lost to American history."

The commitment to bring Fasanella's art back to its cultural roots has also prompted some innovative exhibitions. "Most working people don't go to museums," Fasanella explains. "They are frightened at the bigness. They feel left out. Going to a museum is like going into a rich man's house. They may have a lot of respect for art, for culture, but museums are like an obstacle course for them."

Fasanella and Carver opted for alternative sites. Thus

Fasanella's paean to his beloved home, *New York City* (1957), is an enormous, detailed, nine-foot-long mural.



Collection of Barbara Kohl-Spiro, Milwaukee

Family Supper, among Public Domain's first buy-back efforts, will always hang in one of America's most widely visited tourist locations, Ellis Island. *The Great Strike–Lawrence 1912*, a salute to ethnic diversity, is hanging in the Rayburn House Office Building on Capitol Hill in Washington, D.C. *Welcome Home, Boys*, Fasanella's tribute to labor's contribution to World War II, now greets a new generation of multicultural workers at the main library in Oakland, California. And *Subway Riders*, soon to be owned by the Museum of American Folk Art, will reside in a specially designed protective case in a Manhattan subway station at Fifth Avenue and 53d Street. "It was pretty obvious, wasn't it?" deadpans the resourceful Ron Carver.

Fasanella, at age 78, claims to be slowing down, but evidence is scant. As he takes a visitor into his basement studio in Ardsley, New York, he points to three recent medium-sized paintings about the 1990 *Daily News* strike and a massive work-in-progress depicting the rise and fall of socialism in the 20th century. Later, he drives to a nearby Nathan's restaurant, which he visits almost every day, and sketches the regular patrons who, over the years, have become his friends and ardent fans. The artist, now in his element, solicits their opinions, measures their criticism, relishes their praise.

Fasanella chatters incessantly as he draws their faces, peering with soft, brown eyes through his thick glasses. "Most people live a life of beauty," he says, warming to the subject. "Not the Hollywood beauty, but the nice dish on the table, the beauty of a body. I'm observant about that and I put it down in my painting." He tears off a sheet from his sketch pad and hands it to a pleasantly surprised middle-aged man drinking coffee.

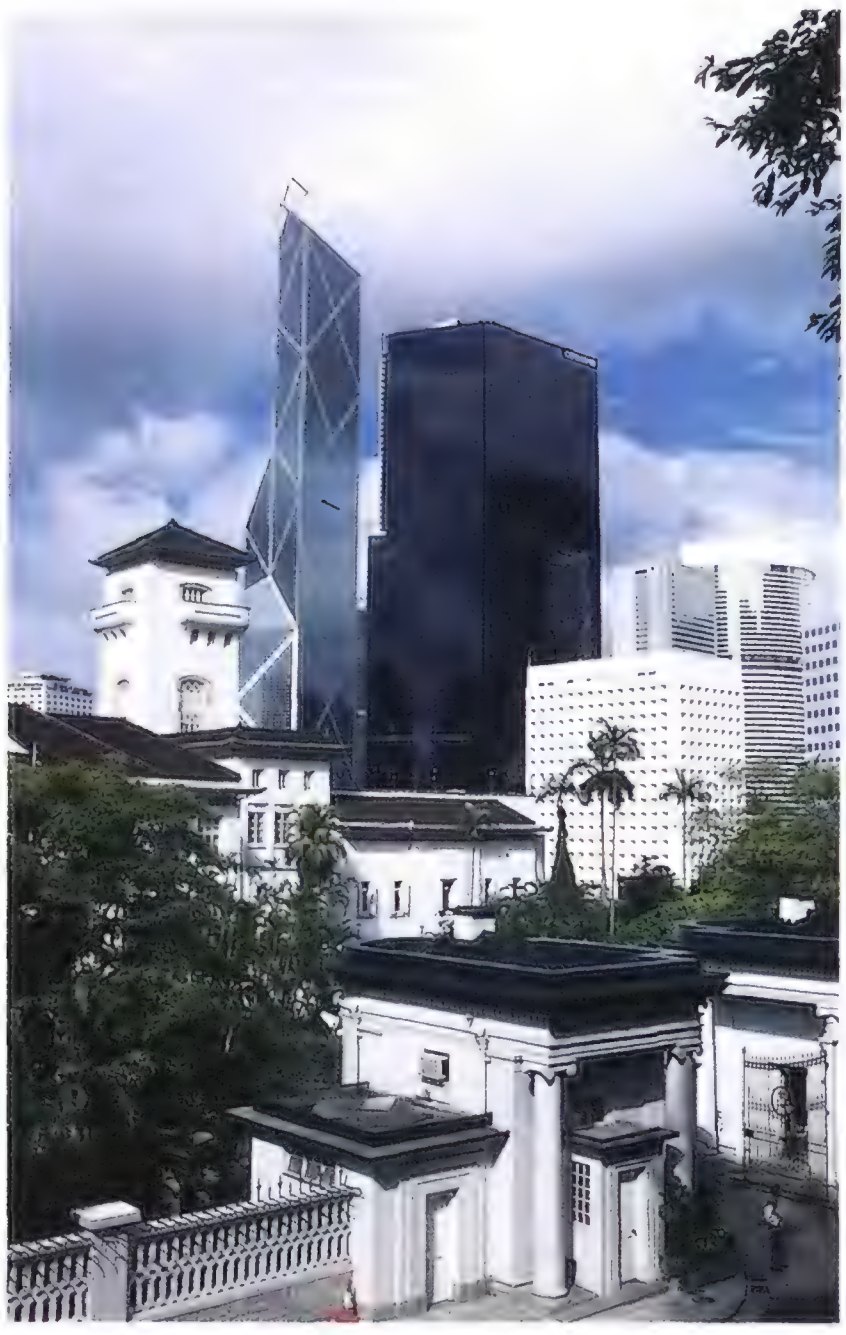
When a jazz musician tells him, "You paint like we play music," Fasanella feels he's communicating. "I look and I look and I look," he explains. "I see all these beautiful things. And I've got to put it on canvas." He pauses to make the point. "The painting's got to sing to me."

In the mosaic, he freely mixed the 59th Street Bridge (center) with elements of his other favorite landmarks. "Every night for years this painting would be in my head," he says. "I was going through my whole life."

By Susan Hornik

How to get that extra edge on health and wealth

Hong Kong may be the commercial capital of East Asia–but when its residents want good luck, they still bank on feng shui



Tall, daggerlike Bank of China is thought to create bad feng shui for the governor's house (foreground).

You could call it a bad week. The water heater cracked, the car battery died again and suds started oozing from the bottom of the washing machine. But when the tax man in Washington, D.C., where my husband and I used to live, sent us a $24,000 bill for back taxes we didn't owe, it was time to do what any self-respecting Hong Kong resident would: call in the feng shui master.

Literally meaning "wind [and] water," the ancient practice of *feng shui* (pronounced FUNG SHWAY) dictated the placement and design of buildings in China to maximize good fortune. Today, even though skyscrapers soar above Hong Kong harbor, an estimated 80 percent of the British colony's six million Chinese use feng shui to choose an apartment, site a factory or get that extra edge in business. Not wanting to be left behind, a growing number of the Territory's 100,000 Western residents are consulting feng shui experts, seduced by the notion that, just maybe, changing a room's layout will make their homes, offices and corporations a little luckier, too. Even the Colony's new governor, faced with increasingly rocky negotiations over the Territory's handover to Chinese rule in 1997, seems ready to join the ranks of those wanting to have the feng shui advantage.

Says Prof. Tunney Lee, on leave from MIT and now head of the architecture department at Hong Kong's Chinese University, "Some people are passionate about it. Some just don't want to take a chance." Few dare to function without it. In the past several months the Colony has experienced a violent crime wave, a new phenomenon blamed on armed Chinese gangs sneaking across the border. The ingenious solution: in addition to increased cooperation between local and Chinese police, Hong Kong Commissioner Li Kwan-ha has reportedly changed the carpet in his office and moved his chair and desk a little closer to the door on the advice of a local feng shui practitioner.

American sociologist Charles Emmons, who has studied the phenomenon, thinks feng shui helps Colony residents relieve anxieties, "especially anxieties over health and wealth." Professor Lee puts it more simply: "It's a way of coping."

Advice from a feng shui celebrity

Figuring that a little help in coping couldn't hurt, I phoned Sung Siu-Kwong, the holder of an M.A. in history from the University of Illinois but one of Hong Kong's feng shui celebrities (opposite). The former college lecturer is a one-man geomantic industry. He offers private consultations, runs a 10,000-member feng shui club and publishes a prodigious number of Chinese-language feng shui manuals.

When the Communists took power in China in 1949, Mao Zedong launched bloody campaigns to wipe out feng shui and other "feudal superstitions," but in today's

Feng shui expert Sung Siu-Kwong holds the primary tool of his trade, a traditional geomancer's compass, or *luopan*. Many of Sung's clients occupy the office buildings in Central, Hong Kong's business district.

more open atmosphere on the mainland, Sung even broadcasts a nightly five-minute TV show from the southern city of Canton. Besides, Sung quickly assures me, "feng shui is about direction and placement. It isn't related to the supernatural."

Indeed, when he arrives at our apartment in gray suit and red tie, the bespectacled Sung looks more like a high-powered lawyer than a soothsayer (and at 64 cents a square foot, charges like one). The first step, he explains, pulling a magnetized *luopan*–the traditional geomancer's compass–out of his hefty leather briefcase, is to determine the building's orientation. Next, he divides each room into nine equal squares and, using arcane logarithmic formulas that take into account a welter of factors including my husband's and my birth dates, analyzes whether we're using the most propitious directions to the best advantage and how we can minimize the ill effects of the unlucky spots.

On hearing of Sung's visit, a Canadian journalist suggests that more foreigners are believing in feng shui because "it's contagious." Ira Dan Kaye, American head of a local textile firm, has his offices analyzed whenever he moves. He tells about one of his managers who ignored the feng shui practitioner's advice. Within a couple of months, the manager's wife broke her nose when she fell down a flight of stairs, his brother was in a car accident, and the distraught young man was beseeching Kaye to call the feng shui master for help. "When you hear stuff like that," Kaye muses, "you think it just may be related."

Even before the Rev. Ernest J. Eitel of the London Missionary Society published the first European study on feng shui in 1873, the practice was enticing and confounding Westerners. In Imperial times, when the Chinese government was forced to cede ports to land-hungry colonial powers, it invariably chose what feng shui experts deemed the worst possible locations. Consider Hong Kong. On hearing of the Crown's newest colony a century and a half ago, even the British foreign secretary, Lord Palmerston, derided the "barren Island with hardly a House upon it" and promptly banished Capt. Charles Elliot, the man responsible for the ridiculous acquisition, to Texas.

Because the Chinese sited towns in accordance with feng shui principles, they generally avoided flat areas,

After sculpture was moved from lobby to front of hotel at suggestion of feng shui expert, business picked up.

In Kowloon's Golden Mile district, tiny shops like this sell feng shui, Buddhist and Taoist paraphernalia.

viewed as vulnerable to flooding and typhoons. A building or settlement was considered ideally situated if it was on the south side of a hill, protected from north winds and marauding bands. Fittingly, when forced to yield land for the warehouses of American and European merchants in Canton, China offered them a mud flat on the Pearl River, the most miserable feng shui imaginable. When every foreign building was rapidly overrun with white ants despite liberal applications of coal tar, carbolic acid and other early Raid equivalents, the Chinese mandarins were undoubtedly chortling to themselves.

After that success, Imperial officials masterfully used feng shui to oppose just about anything the unruly barbarians from the West wanted to build–roads, telegraph lines or railways. In his book, Eitel laments: "When purchasing a site, when building a house, when pulling down a wall, or raising a flagstaff–residents in the Treaty Ports [of China] have encountered innumerable difficulties, and all on account of Feng-shui."

Using feng shui to tweak Western fads and fancies hasn't gone out of style. The five-star Hotel Conrad opened in Hong Kong in time for the start of the Gulf War and a six-month drought of tourists. Last summer a feng shui master discovered the source of the hotel's many problems: the lobby's 20-foot-long bronze sculpture, *Hong Kong People* (above).

The geomancer-cum-art-critic made the practical observation that the 16 life-size figures were "too busy" for the compact space and took up room better devoted to live customers. Worse, a man dashing off the end of the tableau looked as though he was trying to "run out the door." Better to shift the sculpture outside, the master suggested. Says Victoria McGlothren, who was the Conrad's spokesperson at the time, "The feng shui man told us it would create more activity in front of the hotel, which would make people want to come in." That would be good for business, which the hotel swears has markedly improved.

The feng shui master's taste in art–the lobby now boasts a Chinese landscape–meshes with another of Lee's observations: "Feng shui in Hong Kong is a way to establish Chineseness." Experts like Sung, though abandoning the geomancer's yellow robe, favor ancient remedies to channel the environment's energy fields, or *qi* (pronounced CHEE), so that each resident's personal energy is also enhanced.

To absorb the bad vibes in the unlucky southern section of our living room, Sung proposes that we install an aquarium with six black and one red goldfish, or carp. To keep the positive energy (and, hence, money) from flowing out a particularly vulnerable window, the only solution, he says, is to strategically position three potted evergreens on the sill. Our stove's location is a "weak point of the house," and Sung suggests hanging a dried gourd overhead to absorb the negative qi, much to the relief of a frequent dinner guest to whom I once served raw chicken. I'm relieved too. As local singer and actress

Susan Hornik, who lives in Hong Kong, last wrote for SMITHSONIAN *about Polish posters (January 1983).*

Such shops are well patronized; about 80 percent of the British colony's Chinese residents use feng shui.

Components of the highly complex *luopan* include the 5 elements, 8 compass points and 64 I-Ching symbols.

Teresa Norton, who has her residence analyzed annually, says, "You're going to be happy if you feel comfortable in a room, but an interior designer can do that. Feng shui involves history and tradition."

Because the Chinese venerate their ancestors, the belief developed some 3,000 years ago that excellent siting of tombs would bring good fortune to heirs. In Hong Kong–and all over China before the Cultural Revolution's Red Guards ran amok and attempted to destroy every vestige of the past–many a picturesque hillside was dotted with elegant horseshoe-shaped graves. Now, even China is back on the feng shui bandwagon, thanks to the government-sponsored push toward economic development. "All we care about is whether we make money," says one frank official in the southern town of Xiamen, explaining why his Burial Management Bureau is selling gravesites on a lucky hill to wealthy overseas Chinese. The cost for a typical site and burial expenses at the Chinese Eternal Cemetery: $6,800.

Sometime around the Han dynasty, which began in 206 B.C., feng shui was extended to the dwellings of the living. Its influence was pervasive by the mid-19th century, when Eitel was studying its two main schools–one more dependent on the compass and elaborate calculations, and the other a more freewheeling analysis of landscape forms. Eitel notes that not only was feng shui used by officials for siting palaces and towns, but there was also a strong folk element, heavily laden with superstitious strictures against disturbing the land.

In Hong Kong, the British first proposed making the low-lying swampy patch now known as Happy Valley the heart of their new colony. At the very suggestion, Eitel says, "the Chinese community was thrown into a state of abject terror and fright." Thus, when the engineers cutting the road to the valley began dying of fever, and the foreign houses already built there had to be abandoned because of malaria, it was the first in a long line of told-you-so's. At times, the Chinese suspected that the British knew something about feng shui and were just playing dumb. After its disastrous foray into Happy Valley, the colonial government chose to locate in what is today called Central, an area auspiciously backed by rolling hills and fronted by water. Later, when the surveyor general began planting trees on those "barren" hillsides, locals thought him astonishingly astute.

Gradually, British colonial authorities came to show more than a little sensitivity toward the customs of the local Hong Kong Chinese. The public works department has spent hundreds of thousands of dollars over the years rerouting prospective roads, tunnels and bridges that were about to endanger inhabitants' feng shui, especially in the Colony's rural New Territories.

Feng shui's appeal among Hong Kong's well-educated urban sophisticates, however, is what has scholars scratching their heads. When Lee recently asked an architecture class how many had discussed feng shui with friends or family in the previous week, three-fourths of the students sheepishly raised their hands.

A survey conducted a dozen years ago offers a clue. One lower-class respondent scoffed, "Only rich people

Bob Fissmer of Monsanto Far East consulted an expert and installed an aquarium to please his Chinese staff.

can afford to believe in feng shui. It's a rich people's game." As Hong Kong has prospered during the past two decades, people have money to spend on bettering their surroundings and more to lose if things turn sour–an unexpected boon to the feng shui profession. Not only that, the city's gung-ho entrepreneurs are eager to take advantage of anything they think will give them a leg up.

In fact, feng shui is taken so seriously by Hong Kong businessmen–Chinese and Western alike–that the Asian edition of the *Wall Street Journal* recently ran an article on how to choose a feng shui adviser. An official at the local Consumer Council was quoted as suggesting, apparently with a straight face: "Keep a maximum figure in mind that you're willing to pay, say, HK$5,000 [US$640]. If the person you are considering suddenly starts asking for $50,000, think hard before committing yourself."

While a few geomancers may be little more than fortune-tellers with a compass, even the most pragmatic indulge in some form of prediction, a mystical element traceable to the ancient Chinese belief that earthly arrangements echo those of the heavens. It's an aspect of feng shui many hardheaded professionals greet with understandable skepticism.

As a lark, in late 1991, the local branch of Credit Lyonnais Securities consulted a feng shui expert on the coming ups and downs of the 1992 stock market. Much to the surprise of the venerable institution based in France, the feng shui prediction was an almost perfect reflection of Hong Kong's Hang Seng stock index. Or, in the abstruse MBA jargon of the Credit Lyonnais analysts who are trying to keep their jobs: "An Elliot wave analysis of the chart found an eerie number of near perfect Fibonacci ratios between the chart movements."

For some, the modern geomancer may be as much management consultant as wizard. Recently, when a feng shui master toured Metro Broadcast, a Hong Kong radio network, he nixed letting employees enter the newsroom through the side door. Better, he said, to use only the main entrance, following the route the money comes in and thus encouraging more financial blessings. Of course, using the main door also meant reporters could no longer avoid walking past the boss' office, thus letting the general manager keep better tabs on his minions' comings and goings.

Feng shui also offers a kind of one-stop shopping in a hectic world. Steve Lazar and Paula DeLisle, a two-career American couple living in Hong Kong, called in a feng shui man after a spate of petty but pricey disasters: when their washing machine broke down, new parts mailed from the States arrived in unidentifiable pieces, and their Volvo's inexplicable lurch into a pothole caused a heart-stopping $6,400 worth of transmission damage. "We don't have time for this stuff," says DeLisle. "If we can stop these hassles by putting around a few gold coins and buying some goldfish, it just makes sense."

According to the couple's geomancer, the shapes, heights and positions of new neighboring high-rises have hurt their building's formerly positive feng shui. Because feng shui experts associate straight lines with bad influences, they abhor structures with sharp angles, which Sung says are like "daggers" pointed at vulnerable neighbors. Even governments aren't immune. For years, the Hong Kong Chinese thought the British quite clever for building Government House, the governor's residence, on the city's most auspicious hillside site, with tall trees behind, curving roads in front and a spectacular view of Hong Kong harbor.

Sharp edges cast negative darts

But in the late 1980s the Chinese government commissioned the renowned Chinese-American architect I. M. Pei to build a soaring new Bank of China building down the road from Government House. At more than 70 stories, it was the tallest structure in Hong Kong, dwarfing surrounding high-rises. In Pei's typically severe style, the dramatic triangular structure bristles with unlucky sharp edges said to cast negative darts not only on the competing Hongkong and Shanghai Bank but also on the governor's residence and nearby Lippo Centre, known until recently as the Bond Centre.

That's Bond as in Australian tycoon Alan Bond, worth more than $100 million in the booming '80s and now broke. The rest of the world may think the Bank of Credit and Commerce International was bankrupted by graft and greed, but Hong Kong cognoscenti point to the fact that its Hong Kong subsidiary occupied a corner of the Bond Centre facing one of Pei's deadly edges.

The Hongkong and Shanghai Bank, which recently announced an annual profit of $1.9 billion, has obviously protected itself better. The bank not only occupies one of the city's luckiest sites, farther down the hill from Government House, but it also solicited the advice of feng shui consultants at every stage when building its new 47-story, $670 million headquarters in the early '80s. Respected British architect Sir Norman Foster took extra care in the placement of the bank's talismans–two bronze guardian lions–and heeded the advice of a feng shui expert, pointing triangular structural supports skyward rather than toward the ground and readjusting the angle of the exterior escalators.

Meanwhile, the Colony's new governor, Chris Patten, who suggested making democratic reforms before the Colony reverts to Chinese rule in four years, has been under constant fire from Beijing for being a "cunning political trickster." Since moving into Government House last July, Patten's daughter has had appendicitis, he was briefly hospitalized for angina, and his dog Soda ran away. As Sung says, "No governor has had good fortune since the new Bank of China was built."

But is the governor's only option a stiff upper lip? Lee points out a fundamental difference between traditional feng shui and Hong Kong's modern variation. "In the past it was much more passive," he says. "When a village's feng shui was threatened, peasants often abandoned their homes. If fate dealt a poor peasant a bad hand, he had to live with it. That's no longer true. Now bad feng shui is a 'siting problem' that can be fixed."

Hong Kong's citizens, chatting on their mobile phones while steering spit-polished BMW's to work, are not about to let a sharp corner or poorly positioned desk get in the way of their continued progress. Evidently, neither is their governor, who has recently hired a Hong Kong architect known for his feng shui sensibilities to renovate Government House.

As for us, the landlord finally sent a plumber, and a new battery has our old car reliably humming along. No word yet on whether feng shui works for taxes.

Hong Kong hillside blessed with good feng shui is an ideal site for this 300-year-old tomb of a wealthy man. The Chinese have believed for at least three millennia that the auspicious siting of tombs benefits the heirs.

A heavy-laden but still cheerful pre-WWI mailman pauses briefly on his appointed rounds. After the war, the load limit per letter carrier had dropped from 70 to 35 pounds, but there was no abatement of dogs.

By Michael Kernan

Some beguiling mail chauvinism at a brand-new museum

The Postal Service and the Smithsonian Institution open a permanent show-and-tell about when and how the mail went through

Atrium gallery of mail-carrying machines includes a De Havilland DH-4 biplane and 1939 Stinson Reliant.

The story goes that when Cyrus the Great wanted to send a private, special delivery message, he shaved the head of a slave, wrote his message on it, waited till the hair grew back and dispatched the messenger to the recipient, who then shaved the bemused slave again and read the message.

This was a fairly secure mail system. But not very fast.

Cyrus had his empire-wide courier network in the sixth century B.C. Ever since then, postal authorities have been trying to improve on his time.

The story of how they have done it is laid out dramatically in the Smithsonian's new National Postal Museum, which opened July 30 in the stately old granite post office building next to Union Station in Washington, D.C. This state-of-the-art museum is a long step up from the Smithsonian philatelic collection that finally burst out of its crowded crannies in the Museum of American History. Centered on an atrium full of airplanes, mailtrucks, a train and a stagecoach, the Postal Museum ingeniously manages to turn postal history into a hair-raising, and sometimes hilarious, adventure.

You wouldn't believe the problems your mail carrier's ancestors faced.

In the 16th century, about the time mail grew from a private courier system for royalty and clergy into a more or less public service, mailmen carried pikes. With these they could ward off marauders—and also pole-vault across swollen streams.

In India, carriers were given a Y-shaped stick (to throttle hostile snakes) and a bell (to frighten off tigers).

Even in pre-Revolutionary America getting the mail through was no picnic. In 1673 the Colonies started mail service between New York and Boston, a distance of 260 miles. On horseback the trip took two weeks. This was partly because mail carriers were supposed to blaze trees to mark the trail as they went, as well as keep an eye out for escaped slaves or deserters. And, if interested in making a few extra shillings, they might pause to help herd some oxen or load up with pots and pans and assorted trinkets to sell to settlers along the way.

Then there were the ferries, often the only way of crossing rivers. Many a post rider and his mailbag had to wait for hours, depending on the presence of other passengers and quite possibly the ferry operator's mood or sleeping habits. Mail was not cheap. At a time when 50 cents a day was a decent wage, a letter from New York to Philadelphia cost about $3.50; from New York to Williamsburg, Virginia, more than $11.50.

You get the feel of all this in the museum when, leaving the atrium, you enter a "time tunnel" that leads to one of five major exhibit galleries. The entrance corridor becomes a dirt road. Twigs crack, leaves rustle in the wind, crows caw, a storm gathers. By following a line of blazed trees you finally reach the warm glow of a tavern.

"There are over 70 environmental sounds in that passage," said museum director James H. Bruns, whose personal favorite this exhibit is. "There's even a bobcat growling, which should hustle 'em along a bit."

The next exhibit is a lesson in geography that traces the expansion of America after the Revolution, when its

Color photographs by Robert C. Lautman

Many small-town and rural post offices also sold groceries, hardware, hard candy, chewing tobacco and corncob pipes. At this one, about 20 miles from Fort Stanton, New Mexico, travelers pause to take pictures.

citizens ventured inland from beyond the narrow band they had always clung to along the coast. You will already have seen the spectacular 1851 Concord stagecoach in the atrium, where it careens behind its team of four life-size horse mannequins (horsequins?) out of a covered bridge and around a curve above your head. Bruns himself bought that coach at auction in Pennsylvania.

"It wasn't pleasant, riding in a stagecoach," Bruns remarked. "The seats were hard and the springs primitive, and there were no heaters. There would be maybe nine people in it. In our replica stagecoach we have supplied three of them to keep you company, a fat man with a cigar, a woman with a crying baby, and a somewhat unsavory thin guy who looks as if he hasn't taken a bath for a while." Sir Richard Burton, who had endured unspeakable hardships while looking for the source of the Nile, advised anyone traveling by stage in America to lay in "five days' worth of opium."

By 1858, the overland mail had to cross the wilder half of our continent to reach booming California. The postmaster general at the time was a Southerner, so the stages naturally followed a southern route, which took 25 days. But Northern Congressmen, fearing that they might lose California to the South in a secession, wanted a more northerly route as well, and incidentally, one that was 1,000 miles shorter.

So was born the Pony Express.

The Pony Express exhibit features belt buckles, a spittoon, a saddle and some disenchantment. Note: Buffalo Bill probably never rode the Pony Express. "It looks like he made that up," said Bruns. Note: contrary to the old paintings and posters, riders didn't carry saddlebags, or rifles either. They had a *mochila*, a small leather poncho that fit over the saddle and had a pocket in each corner. The pay was $25 a week for "young skinny wiry fellows, not over 18," preferably orphans, by one account. A letter from St. Joseph, Missouri, to San Francisco cost $5 (later reduced) per half-ounce, but with luck it could get there in ten days. The startling fact is that the Pony Express, for all the books and movies it has inspired, existed for only 18 months. The transcontinental telegraph line killed it as of October 26, 1861.

Speed was on everyone's mind, possibly even more in those days than now, for America was witnessing radical change: the abrupt end of the Age of the Horse after thousands of years. The Iron Horse, spitting steam from its nostrils, became the hauling vehicle of choice. Still, under special circumstances animal power lingered on. In downtown Philadelphia, for example, some streets were so narrow that horse-drawn package-collection

Michael Kernan frequently does articles for SMITHSONIAN. *As a freelance writer, he says, he has become expert in the ways of the post office.*

wagons had to be used to carry mail as late as 1955.

The Post Office even imported some camels in mid-century to cover routes in the Southwestern desert. This was supposedly an idea dreamed up by Jefferson Davis before the Civil War, when he was Secretary of War. It was not a great idea. The camel's peculiar sidling stride got the riders seasick, and being famously disagreeable besides, camels tended to bite, kick and spit on their drivers. Unfortunately, many of these obstinate mail carriers were simply turned loose in the desert.

The Post Office also experimented with reindeer in running the mail across many frozen miles in Alaska. But despite the stories about Santa Claus, reindeer didn't like being put to work and, like the camels, they bit their riders whenever possible. In the Far North dog teams were used with greater success into the 1960s.

In general, dogs have a big reputation in the mail service, and not just because people joke about dogs biting postmen (dogs bite mail carriers pretty much on a seasonal basis, most frequently on Saturdays in summer). Post Office Jack, a big black dog of Monument Beach, Cape Cod, in Massachusetts, became a local hero for picking up mail sacks dropped from passing trains and delivering them to the post office across the street. He died in 1911, full of years and showing a "growing fondness for sleep." Circa 1911 in Chanute, Kansas, a dog named Shep, breed unknown, actually delivered letters to the upper floors of buildings–one customer per trip–for his master, Stephen T. Sloan. Shep would not ring the doorbell but would scratch on the door. He died saving his master from an irate hog.

To this day, mail in the Grand Canyon is delivered by mule train. Five days a week the mules sway surefootedly down from Hualapai Hilltop to the Havasupai Indian reservation 2,400 feet below the South Rim. The mules deliver mail in a remarkable variety of forms: in addition to letters and magazines, the bags are apt to contain baked goods, dairy products, eggs, soft drinks and the backpacks of lazy hikers.

The great American mail robbery

We are back in the 90-foot-high atrium again, under its thick glare-proof glass ceiling, and can take a minute to observe some much faster means of mail delivery: half of a full-scale replica of a railway mail car with matching depot; a vintage 1931 mail truck; a 1960s Mailster car; an airmail beacon, one of hundreds that were strung across the landscape so that fliers could find their way point-to-point.

For nearly a century most bulk mail in the United States was moved by train, a practice that led, among other things, to a great American ritual–robbing the mail. In the days before computers, credit or wall-to-wall checkbooks, thousands of dollars in bills and gold–pay-

Begun in 1896, Rural Free Delivery was horse-drawn. Customers could buy stamps and send money orders.

A mail pilot inspects his Curtiss Jenny after a crash. The first nine years of airmail saw 6,500 forced landings.

In Korea in 1953, tanks were pressed into service to be sure forward-area soldiers had "mail call" too.

In icy months, an upstate New York carrier turned his 1921 Model T Ford into an early model snowmobile.

Snazzy stagecoach, which ran from New Hampshire to Vermont in 1850s, carried mail and passengers.

roll money from companies all over the country and deposits from local banks to the Federal Reserve–shuttled back and forth across the nation. Enterprising groups with masks, horses and six-guns regularly had a crack at it. Fortunately, not all thieves were skilled at their work. One desperado, after losing one-half of his theatrical mustache disguise at the scene of a mail robbery, went right on wearing the other half and was arrested.

Overhead in the atrium are three mail planes: a 1911 Wiseman-Cooke flyer with stabilizers in front and back (so that one can tell if it's coming or going, an aviator mannequin was installed); a De Havilland "flaming coffin," so called because the gas tank sat virtually in the pilot's lap; and a 1939 Stinson Reliant with grappling hook that snatched mail sacks off the ground in the same way mail trains plucked pouches that dangled from hooks alongside the tracks. (In their zeal to get through, flying mailmen sometimes cut phone lines strung inconveniently in their path.)

Airmail service was begun in 1918 between New York and Washington, D.C. (SMITHSONIAN, May 1982). From the beginning it was fraught with incident. On the inaugural flight one plane headed the wrong way and cracked up in a plowed field somewhere in southern Maryland. The same year, in an epic race from New York to Chicago and back, fliers tried to show the mail could be delivered in ten hours. After a seemingly endless series of setbacks, recounted in Bruns' latest book, *Mail on the Move*, one plane set a mark of 9 hours 18 minutes, less than half the time it took trains to deliver. Eight mail pilots were killed in the first two years of the service. It was truly seat-of-the-pants flying: sometimes the horizon indicator was a half-empty whisky bottle. And there were no parachutes.

There seemed no end to the ways of moving mail. In use at different times were motorcycles, electric cars, balloons, surplus World War I trucks, steamboats, helicopters, ocean liners, bicycles, sleighs, snowshoes, satellites, buses, trolleys, pneumatic tubes. Beneath New York City streets were 27 miles of dual eight-inch tubes. They connected the main post office at 33d and Eighth to 21 stations in Manhattan and traversed a bridge to Brooklyn. They were used to deliver light mail as late as the 1950s.

Carriers also used their feet. At the turn of the century they had to lug up to 70 pounds, reduced to about 35 after World War I, still the going weight today. In one exhibit a reconstructed 1800s mailbag makes clear that most of the contents used to be newspapers. Today, it's magazines and glossy catalogs.

Before the wire services brought us instant news–too much of it, some say–mail was the best way for newspapers to get information, which may explain why some early postmasters were also newspaper publishers. And why so many newspapers are called *The Post*. There is a whole wallful of *Post*s displayed here, in fact.

During the Civil War, copying stories from papers in enemy territory could be risky. A number of newspapers, especially in border states, were closed down, charged with aiding the other side, and their publishers banished for the duration.

Even mailbags have their story. An investigation in 1916 revealed that bags were disappearing in South America in large quantities. A merchant-postmaster, it was discovered, was using them to make a full set of

Don't you wish we could just do this to CFCs.

In a way we can – if we cool our buildings with natural gas.

Natural gas absorption cooling equipment cools with water, rather than with CFCs, which deplete the ozone layer.

It also has fewer moving parts than conventional cooling systems, which means maintenance costs are lower.

And, because it costs much less to operate, it cuts the energy costs of cooling—by up to 50%.

There's another big benefit, too. It saves electricity during the heat of the summer, when demand is at its highest.

As a result, we can help our cities avoid brownouts. And help reduce the need for power plants. Best of all, we can help America balance the use of its energy resources.

No doubt about it, natural gas is a high-tech, low-cost way to keep cool without CFCs.

It's a cool way to help save our ozone layer, too.

Clean, economical natural gas. Think what we'll save.

awnings for his store. Another was turning out heavy-duty pants and sleeveless shirts for his children, who thought the "U.S. Mail" inscription looked cool.

Another major exhibit area is called "Customers and Communities." You are brought face to face in very real, personal terms with what it means to mail carriers to move a piece of mail, and confront what some postmasters have had to deal with. As a very young man, author William Faulkner was a postmaster at the University of Mississippi. He hated the job and threw out or lost so much mail that he was fired. His parting words were, "I reckon I'll be at the beck and call of folks with money all my life, but thank God I won't ever again have to be at the beck and call of every SOB who's got 2 cents to buy a stamp."

The surroundings aren't always comfortable, either: in one exhibit you are snowed in, with a Rural Free Delivery sled and a Model T on skis. ("We had an awful time getting the snow right," Bruns said. "Soap flakes don't work, cotton gets dirty–we ended up with some kind of plastic.")

Mail-to-your-door service began in America's cities on July 1, 1863, the first day of the Battle of Gettysburg. Before then, women had to pick up their mail at the Ladies Window of local post offices. Time and again as the war's cruel casualties mounted, they would read the mail while standing there in front of clerk and customers, and learn that their sons or husbands had been killed. And would have to walk home in their grief bearing the last packet of letters. It was only humane to take the letters directly to the people's homes, the clerks said. So, after considerable lobbying in Congress, home mail delivery began.

Rural Free Delivery, on the other hand, which brought mail to folks in sparsely populated areas, didn't start until 1896. Like Parcel Post, which followed in 1913, RFD was a godsend. Now you could have chicks delivered by mail–in shallow perforated boxes carrying 100 fuzzy creatures all cheeping at the top of their tiny lungs. You could send away for a turtle or horned toad (from the great old mail-order novelty house of Johnson Smith and Company, whose catalog filled the daydreams of generations of American youngsters). You could send queen bees in the mail too. There is on display a little wooden box with a mesh top designed specifically for queen bees. Heaven help the carrier who was overtaken on his route by a bee swarm in search of a queen.

Inevitably, American enterprise being what it is, almost immediately after Parcel Post was established, some citizens actually mailed children. In 1914, in a story that would delight the heart of Lake Wobegon's Garrison Keillor, May Pierstorff, age 4, was mailed from Grangeville, Idaho, to her grandmother in nearby Lewiston. The charge was 53 cents, based on her weight with belongings of 48 pounds. It was a good deal cheaper than train fare. According to the *Lewiston Morning Tribune*, she was not wrapped, but simply boarded the local train and sat in the mail car with stamps attached to items she was carrying. The conductor was surprised.

Famous 1901 misprint is a cherished collector's item, though more than 150 uncanceled stamps still exist.

Owney, a terrier who adopted the Postal Service, remains a presence, thanks to the art of taxidermy.

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Eric Long

Massive exhibit of private letters includes samples written by the Madden family between 1740 and 1992.

There are now rules forbidding the mailing of human beings. Also snakes and black widow spiders.

Though no one is likely to forget, with stamps costing what they do, the museum reminds us that mail is a business. Nearly half of all first-class mail is metered, and there are early model postage meters on view. Mail is a romance too, and part of the museum is devoted to intimate letters handed down for generations: wonderfully excited letters in bad English from immigrants to the folks back in the old country; unbearably touching last letters from American soldiers at war; greeting cards that demonstrate how we viewed women and minorities and occupations over the decades and what we thought was art (at one point we found feathers a most pleasing esthetic effect).

The first exhibit of family letters (part of a planned series), missives written by members of the Madden family, is likely to slow down the crowds as they shuffle past. The correspondence of this African-American family started more than 250 years ago with the indenture records of the matriarch, Sarah. Her son Willis owned 87 acres and built a tavern in Virginia, nearly lost his land in the Civil War but carried on. There are letters from his daughter and his grandson and beyond, family letters from the District of Columbia, from Iowa, from Rome, Italy.

In addition, there are plenty of curiosities in this busy place. You will find Owney, a travel-minded terrier (now stuffed) from Albany, New York, who loved to ride in mail cars, perched on sacks of letters. He was so devoted to mail bags that when one fell off he jumped off too, and waited with it until help came. Pleased mail clerks bought him a collar marked "Owney, Post Office, Albany, N.Y." and trainmen took care of him wherever he went. Before his retirement in 1897, he traveled all over the United States, Mexico and Canada, and even around the world, aboard a mail steamer. Among the tokens he received was one that read "Good for a 5-cent loaf of bread" and another, "Good for one drink or cigar." Eventually, his collar became so heavy with souvenir baggage tokens and tags that he had to be fitted out with a special harness to help him carry the weight. Before he died in 1897 from a rather mysterious bullet wound, Owney logged 143,000 miles.

Of course, this all started with stamps, with the vast Smithsonian collection of 16 million items, the largest of its kind in the world. The collection has now found a new home here, along with a 7,000-square-foot library, a philatelic research center, lecture hall, museum shop and stamp store. There are pullout shelves and special carrels for serious study.

Though this is a historical museum, not a stamp museum, some exhibits show how stamps are produced and what the stickum is made of (potato gum, then cassava, then corn, then synthetics–all kosher, naturally) as well as how stamps are counterfeited and what shapes they take (ours are conservative, just the right size for a single lick, but some countries make them in the shape of bananas, coconuts, maps). A few are 3-D wiggle pictures or tiny playable phonograph records.

Inevitably, on hand along with a celebrated upside-down-train stamp, is the 1918 airmail stamp of an inverted Jenny (Curtiss J-N4), perhaps the most famous philatelic oddity. One of 100 stamps with the mail plane printed upside down, it was part of an issue to celebrate the start of airmail service. A plate block of four inverted Jenny stamps recently sold at auction for more than $1 million. There is a Pigeon Post microfilm dating from the Franco-Prussian War, when homing pigeons were removed from besieged Paris in hot-air balloons and taken to unoccupied France. They then flew back into the city on their own, carrying on their backs tiny quills containing letters reduced on film. On receipt, the letters were enlarged on a screen. There is an Amelia Earhart cover from 1935, a 1937 cover of the *Hindenburg* zeppelin crash and a good assortment of other EFOs, "errors, freaks and oddities."

The security in this section is elaborate.

"One of the rooms here has a ceiling decorated with oversize versions of the inverted train," Bruns said. "I told a workman about the stamp, how the train is upside down in the frame, and he hit his head with his hand and shouted, 'Holy smoke! They're all wrong, guys, we gotta do 'em all over again!'"

Old postal building, where new museum is ensconced, has had lofty lobby restored to its 1914 splendor.

Flanked by feathered beast, Stern peers down from 23d Street rooftop to get better fix on pensive pelican.

By Richard Wolkomir

In deepest Gotham, stalking the wild and woolly gargoyle

Henry Stern, former Parks Commissioner, has found an irresistible quarry in the stone menagerie festooning New York's buildings

"I counted 20 tortoises and 51 hares, so let's see if I was right," says Henry Stern, peering up at 1040 Park Avenue, in Manhattan. We are, as Stern likes to say, "on safari." He has bagged a trophy: a 1920s apartment building embellished with a frieze of hares chasing tortoises, carved into the stone.

Stern is president of the American Association for the Advancement and Appreciation of Animals in Art and Architecture, or the AAAAAAA. For practical purposes–sometimes Stern forgets an A, or adds one by mistake–the abbreviation is further abbreviated to the 7A. Actually, Stern is not the president of the 7A. His precise title is Co-Top Dog. (His cohort or Co-Top Dog is Adrian Benepe, a friend from the New York Botanical Garden.) But that is a technicality.

The important thing, this morning, is to shuffle around 1040 Park Avenue, counting hares and tortoises. Stern peers upward, pointing at each hare and tortoise as he counts. He blithely ignores the doorman's suspicious glower and the wondering looks of Upper East Siders, with their trench coats and Walkmans and briefcases, catching cabs and buses to their offices downtown. With his neck craned up, he misses a passing dog walker with eight real mammals of assorted sizes, all straining at their leashes in several directions.

"OK, I got the same–51 hares, 20 tortoises," Stern announces in the intonations of deepest Gotham. "What did you guys get?"

The tally is agreed: 51 hares, 20 tortoises.

"Most people don't even notice these animals," Stern

says, eyeing the Manhattanites on the corner. He approaches a young woman waiting at a bus stop, clenching a handbag decorated with brontosauruses.

"Pardon me, but have you ever noticed anything unusual about this building?" he inquires.

The woman looks startled. But Stern is not threatening–medium height, tousled gray hair, wearing a necktie only slightly askew and decorated with tiny Kermit the Frogs. She gazes at the building and shakes her head.

"Didn't you ever see all the hares and tortoises up there?" Stern persists, pointing. The woman looks and smiles. "I never noticed them," she says.

"Little creatures are carved into buildings all over the city," Stern tells her earnestly. The woman's bus comes–she looks grateful. She steps aboard, waves tentatively to Stern and disappears toward downtown.

Stern's organization of 250 or so members, mostly in New York City but a few as far off as San Francisco, is trying to catalog as many of these stone animals as they can track down. That includes a menagerie of creatures decorating buildings in all five New York boroughs. Stone, by the way, is not the only medium: artisans have also worked in such materials as metal and terra-cotta.

Around the year 2000, the organization hopes to produce a "field guide" to the city's architectural animals. It is a big job, and Stern seems to have decided that the best way to tackle it is haphazardly. Nobody is scouring the city block by block, according to some strategic plan. Instead, members send in reports whenever they spot something, and Stern adds them to a messy list at his downtown headquarters, when he has time to spare from his other duties as president of the Citizens Union, a city government watchdog group. (The 7A constitutes one of that organization's projects.)

In the bag: two stone lions

Right now, the hares and tortoises tallied, Stern leads his little safari on through the Upper East Side and quickly spots more game at 1025 Park Avenue, a house that was built in 1912 to emulate the Jacobean mansions of the 17th century. Stern points at two lions over the main entrance. "Note that they are baring their teeth," he observes. Having bagged the lions, Stern leads his entourage on a little farther to the old servants' entrance, which turns out to be decorated with a sculpted animal skull. "That's probably a cow's skull, or an ox's, or maybe a bison's," offers Stern.

The significance of the regal cats over the magnate's entrance versus the animal skull over the servants' entrance is obscure. Some point about social class? Stern says meanings are beyond his purview–"Who knows? We just find these things–we even found a listing to go under *Q*, a quahog at 57 East 64th Street."

On to 1000 Park Avenue. "A noble address," avows Stern. "Look, above this side door, there's a bushy-tailed squirrel chewing a nut, and also an owl–we should note that this is a plastic surgeon's office." The next entrance leads to more plastic surgeons, with more stone squirrels and owls. The question is raised, but not answered, as to whether plastic surgeons may be evolving a professional heraldry, in which squirrels with their sharp nut-cutting teeth represent precision instruments, and owls stand for perspicacity in where to make the cut. "That's just speculation," Stern admonishes, rounding the building's corner and pointing out yet more squirrels and owls. "Look–they chipped off some of a squirrel and an owl's left wing to make way for an air conditioner. That's a little desecration we're seeing.

"Once you get into this, you walk down the street with your head up," continues Stern, who is indeed walking down the street with his head up, not noticing that

Stylized croc bestrides column at entrance to building, now Liberty Tower apartments, dating from 1910-11.

Photographs by Peter B. Kaplan

passers-by are eyeing him curiously. He has now zigged and zagged his way to 1021 Park Avenue and stopped to stare at the carvings in the facade. "Two noble eagles," he muses. "But, look, they have elaborate tails–these could be peacocks." He gazes quizzically at the birds. "Possibly, we have vultures," he ventures.

"Now here's a synagogue from 1922, and at least it has some Jewish stars and some carved foliage, but notice that this next building is from 1975, modern and plain–let's call it 'bereft,'" declares Stern. On to the corner of Third Avenue and 85th Street, a bank. Stern makes a major find: a crest showing a dog sitting on a money box, plus seven bees swarming around a beehive, and a rendition of the Seal of the City of New York, which includes an eagle, two tiny beavers, a barrel and a stylized windmill. Stern greedily counts the separate animals in the single carving, all to be added to the 7A's collection, which already exceeds 1,000 such beasts.

An inevitable question with any Henry Stern enterprise is this: Is the man serious? Christopher Gray, an architectural historian and *New York Times* columnist, serves as the 7A's official historian, on a volunteer basis. "I was volunteered," he explains, a bit grumpily. In answer to the "Is Henry serious?" question, he says, "Well, he's been pestering me about this project for ten years."

To understand all this, it helps to go back to when Henry Stern was New York City's Commissioner of Parks and Recreation. In fact, it is helpful to go back to when his name was first proposed for the job to then Mayor Ed Koch, who reportedly responded: "You gotta be crazy!"

On a first-name basis–with trees

Henry Stern's reign as New York's Parks and Recreation Commissioner began in 1983, with a declaration: he would be the commissioner "for all species." It ended seven years later with an encomium in the *New York Times*. "You must be on a first-name basis with each of the 2.7 million trees under your jurisdiction, what with the way you order your driver to swerve to a stop in front of favorites," the reporter noted. He went on to list some of Henry Stern's achievements as commissioner, which ranged from turning hundreds of acres of concrete into grass and trees, to starting the "Beast of the Month Club" and naming Kermit the Frog official Parks spokesamphibian. "And thanks," the *Times*man concluded, "for many, many beautiful days."

Henry Stern explains the 7A in three ways. "I've always been a founder, the Johnny Appleseed of organizations," he says, citing CABOOSE, which he began 25 years ago–Citizens Against Billboards Over Our Subway Entrances. Lurking behind the high jinks is a staunch New York patriot who loves his city and wants to keep it. . .what? "Beautiful" is not exactly descriptive of the city that never sleeps and rarely cleans its streets, either.

Sara Cedar Miller

Endlessly inventive in promotion efforts, Commissioner Stern takes Central Park's Sheep Meadow back to its roots.

Marc Vodofsky

Paying homage to vernal equinox, Stern as "Sun King" leads festivities at Staten Island's Clove Lakes Park.

Kevin Cohen

Stern celebrates new Brooklyn bike path in a ricksha powered by Transportation Commissioner Ross Sandler.

David Cantor

Space-suited Stern marks 20th birthday of the U.S. lunar landing, calling Sheep Meadow "Moon Meadow."

But Henry Stern is distressed to see the city's older buildings, with their architectural detail and human scale, inexorably replaced by new glass towers as featureless as robots. "They call it modern–I call it faceless," he asserts. "We want a revival, and our war cry is 'Bring Back the Beasts.'

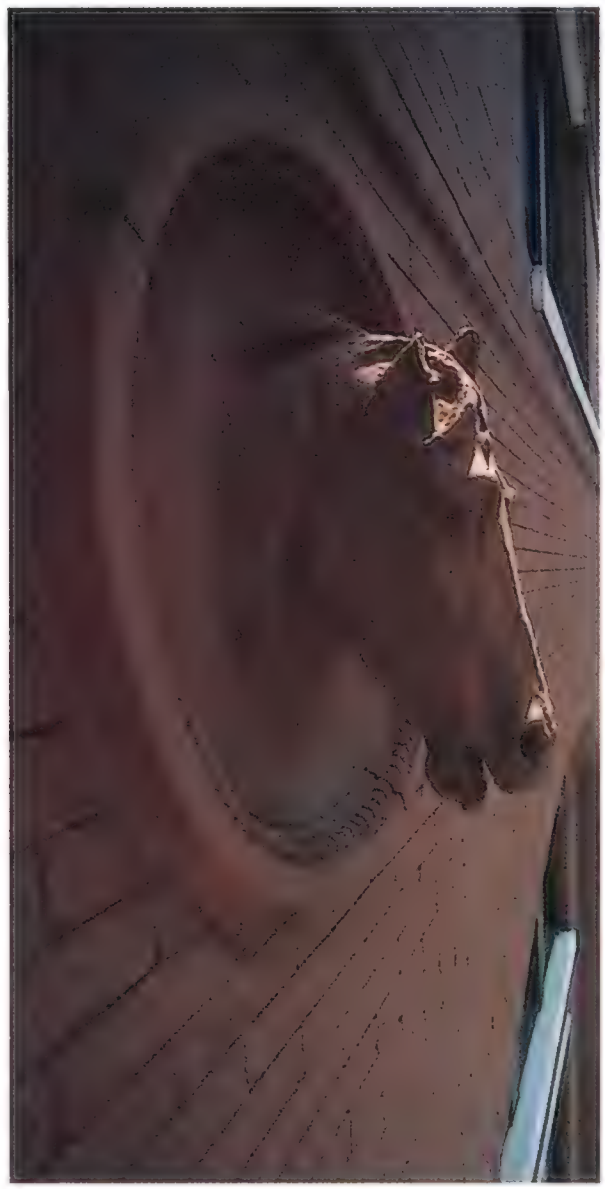
"I noticed the building sculptures because I'm always looking around," he goes on. Which is true. To walk down a New York street with Henry Stern is to feel yourself in the company of a shuffling raccoon, continually turning its head at odd angles to peer at this or that, ready to turn any handle just to see what might be behind the door. As you talk to him, you can see his attention fade and refocus as his feral brown eyes alight on some new fascination.

Henry and Boomer: symbiotic snackers

"I've always loved animals–right now, besides two kids, we've got a cat named Munchie and a golden retriever named Boomer." Their pooch, Stern says, serves an important household function: "Whenever I go to the refrigerator, Boomer is there, so I give him half–I feel generous, the dog is delighted, and I'm thinner." Stern's liking for creatures "in zoos and out of zoos" preceded Boomer the Diet Dog: "I started with animals when I was a kid and we had two cats, Sonia and Sappho."

Stern was born in 1935 in Manhattan and grew up in Inwood, on the island's northern tip. His mother was a bookkeeper, and his father made tents. He went to the Bronx High School of Science, followed by City College of New York and Harvard Law School. "Those three schools define you–poor, Jewish and smart," he says. Journalism attracted him, but he decided on a career in government because he loved current events. He clerked for a State Supreme Court justice, then held a smorgasbord of government posts, including secretary of the Borough of Manhattan, deputy consumer affairs commissioner, and City Council member for nine years, a position that Stern once dismissed as amounting to less than a rubber stamp "because a rubber stamp at least leaves an impression."

No sooner had he taken over as Parks and Recreation Commissioner in April 1983, than he got the department marching to a quirkier drummer. The 7A was already cooking in Stern's imagination during his tour of duty with the Parks Department, but his energies were then engaged elsewhere. "There aren't any other cities that have a parks commissioner who can talk to trees and have them answer," Mayor Ed Koch once bragged. In order to heighten the visibility of the city's beleaguered trees, Stern coined the term "arborcide." He came up with that after Flatbush Avenue merchants, seeking better display for their shop signs, "murdered" four London plane trees. Stern dubbed the episode the "Temple



Touring Manhattan with Stern's-eye view, aficionados of architectural animals espy creatures at every turn: (from left) marble lioness guards entrance to Morgan Library; a terra-cotta horse's head eyes Seventh Avenue.

Square Massacre," and–with Verdi's *Requiem* playing in the background–conducted official funeral services and later planted new replacement trees as a memorial.

When a Queens contractor destroyed 26 oaks, poplars, sassafras and sycamores to clear a view for two houses, Stern required him to plant new trees at a cost of $100,000. "It was the largest settlement ever in an arborcide case," Stern boasted, adding that "the Bayside 26 shall not have died in vain." That memorial service featured a bugler playing taps and cardboard headstones commemorating each species.

Stern started a census of "street trees," conducted by volunteers who counted the city's trees and gave them medical checkups via a health-rating sheet (good, fair, poor or dead). He erected nesting boxes in Central Park to attract barn owls in hopes that they would eat rats. "We built the boxes, but they did not come," he reflects sorrowfully. He dealt like Solomon himself with sharp protests from neighbors of Washington Plaza, in Brooklyn, who demanded that a statue of George Washington on his horse be turned, since its south-facing orientation gives park users a view only of the general's and horse's hindquarters. "If he faces south, rumpus north," Stern mused for the benefit of the *New York Times*. "If he faces north, rumpus south."

The *Times* has also chronicled Stern's alleged idiosyncracies with glee. Supposedly he once walked off a television show to meditate–a story he denies. And he once fell asleep on his couch during an interview, which he blamed on the effects of cold medicine, but which a reporter noted enabled him to avoid sensitive questions on Parks policies.

He had his own way of handling problems. For instance, when Steve (Wildman) Brill was scavenging Central Park for edible plants, Stern finessed the botanical menace by hiring Brill to conduct courses and lead tours, on the understanding that he would no longer eat the foliage. And there was the man whom park employees found living in a Central Park tree house. Stern hired him as a tree pruner.

Commissioner Stern made public appearances in Indian headdress, astronaut's space suit and shepherd's gear. He led a Druid celebration of the vernal equinox at a Staten Island park. He held a press conference perched atop an elephant that unexpectedly reared up, enabling the commissioner to demonstrate his mahout

Richard and Joyce Wolkomir recently wrote a book about real-life animals titled Junkyard Bandicoots and Other Tales of the World's Endangered Species.

Stylized rattlesnake and skull adorn building facade on East 25th Street (top); metal rats skitter up ropes at Grand Central entrance (bottom). Snake coils at West 57th address; bulldog glares from East Side town house.

skills to an admiring press corps. And his office telephone was in the form of a duck. Instead of ringing, it quacked. From all of that, it was no great leap to becoming Co-Top Dog of the 7A.

By now Stern has moved the safari into his 1966 Plymouth Valiant, a dented, dinged and banged-up zombie car–140,000 miles old, its upholstery shredded–that still somehow wheezes down the street, although it is obviously dead. Stern drives the same way he walks, looking this way and that for stone animals, swerving for better views, ignoring the protesting horn honks. "A lot of these animals are so high up they're hard to see," Stern explains, as he stops in front of the Citizens Union headquarters, at 198 Broadway in lower Manhattan, which doubles as the command center for the 7A.

Upstairs, he proudly shows off his correspondence, including one-dollar 7A lifetime membership fees from as far off as Bozeman, Montana, and Portland, Oregon. His thick file of letters includes a note from the art director of the Metro-North Commuter Railroad, asking: "Has anyone told you about the sheep above the entrance to Brooks Brothers?" Another contributor sent in photographs of stone crocodilians climbing the facade at 55 Liberty Street, and a caller came up with a hot tip on a ram's head at 18th and Park Avenue South. One pen pal pointed out that the Morgan Library is decorated with two lionesses, created by the same sculptor who did the New York Public Library's two lion statues–"the Morgan Assyrian lionesses are earlier than the New York Public Library's lions, but I always think of them as their girlfriends," the correspondent noted.

Sightings, meanwhile, continue to mount. "Have you included the spider at 340 East 57th Street?" writes one member. Another brings Stern's attention to the facade of a restaurant at 21 East 61st Street that features "many smiling (or sneering) fish in pairs, showing teeth."

Christopher Gray, whom Stern appointed the organization's architectural historian, grumbles that cataloguing all such beasts by the target date of 2000 is "biting off a lot." When it is noted that one member from Chicago has suggested cataloguing that city's panoply of architectural beasts as well, Gray grumbles even louder: "Oh, sure, let's do other cities, too. Let's do all the cities, and while we're at it, how about Europe?" In fact, he says, New York's stone beasts are derivatives of Old World architectural sculpture. In this country, they are largely decorative whimsy. But the carving of animals into buildings is an ancient practice. And these stone beasts originally radiated meaning.

"Animals on buildings go back to Egyptian and

Mesopotamian architecture," says Christian F. Otto, a Cornell University professor of architectural history. "In ancient times, we assume, this sculpture was never merely decorative–there was always a purpose. In Egypt, for instance, certain animals represented particular gods, or particular properties with which the builders wanted to imbue their structures."

In medieval times, gargoyles–imaginary ferocious creatures–were often aimed at keeping out the bad spirits while sometimes also functioning as rain spouts. By the 19th century, Otto explains, the artisans creating architectural animals were unwittingly drawing on ancient forms. He cites John Ruskin, who watched workers from Ireland carve animals around the windows of the new natural history museum at Oxford. Ruskin was intrigued because he had seen similar designs in Venetian architecture. He asked the Irish carvers what they were doing. They looked blankly at him and said, "Oh, it's just cats and dogs."

New Yorkers are not the only citizens interested in their local stone bestiaries. Princeton University, for example, has already concocted an illustrated guidebook to the campus' gargoyles and other architectural statuary. They range from the chapel's chained dragon to the 1879 Hall's monkey with a camera, presumably capturing a gargoyle's-eye view of students and professors. But no hunters of stone beasts have a larger job than Henry Stern and his cohorts as they fan out through New York's five boroughs, necks craned, eyes on the cornices.

New York's architectural animals are not only numerous but sometimes hard to fathom. Stern points out that over the entrance to Grand Central Station at 43d and Lexington is a canopy held up by cables. Climbing the cables, as if going up a ship's hawsers, are two metal rats. But their way is blocked by two metal rat guards.

Are the rats and rat guards a comment on New York? Is the city under assault by insidious forces that might, perhaps, wish to gnaw away its architectural heritage? Could we say that the American Association for the Advancement and Appreciation of Animals in Art and Architecture is a kind of social rat guard?

The Co-Top Dog refuses to be pinned down. He will only repeat his longstanding motto, slightly modified: "We are a society for all species!"

A young admirer makes acquaintance of one of city's beloved icons, lions guarding Fifth Avenue entrance to New York Public Library. Mayor La Guardia dubbed pair "Patience" and "Fortitude" during the Depression.

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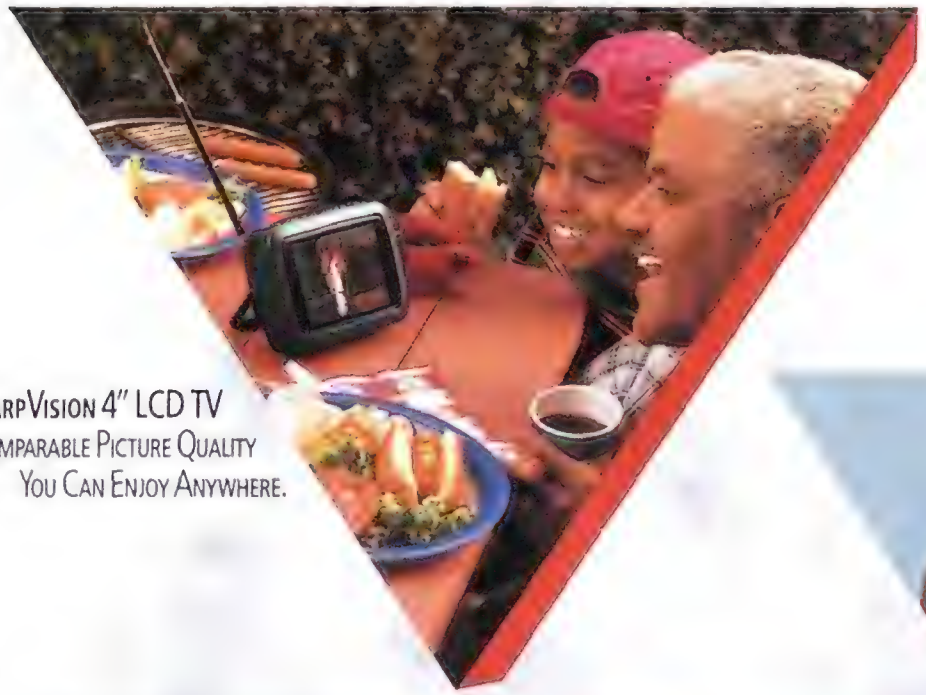

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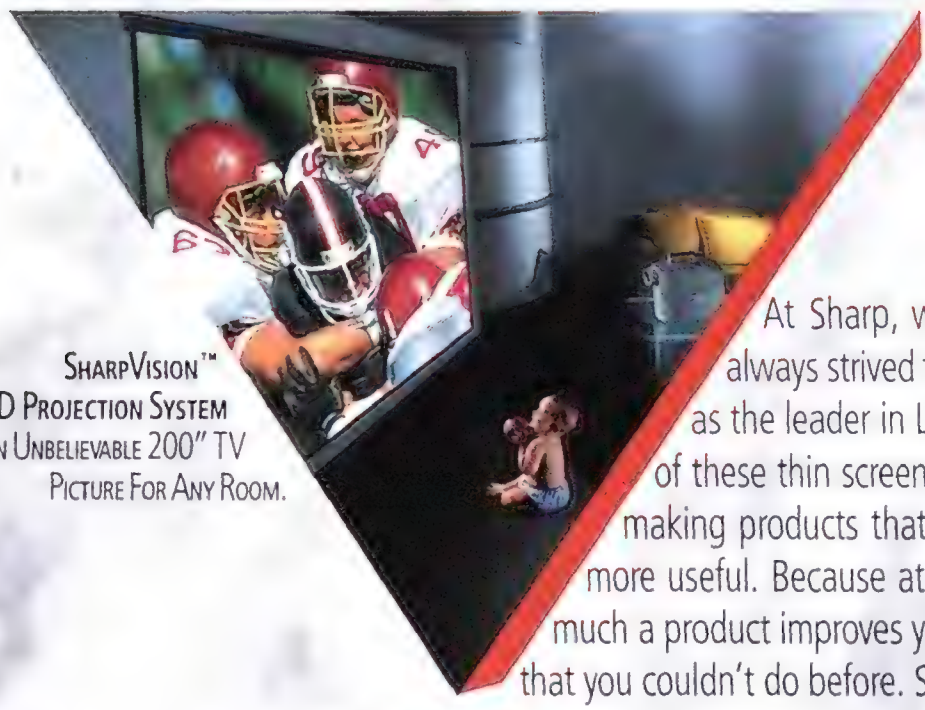

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By Anne and Jack Rudloe

Electric warfare: the fish that kill with thunderbolts

Specialized organs enable certain species to generate enough current to zap their prey; others use volts to find a mate or navigate

Jim Begley moved slowly across the sea bottom off Southern California, giving a verbal description of the topography through a microphone in his helmet to his wife, Natalie Shoptaw, in the boat above. It was a routine survey for an oil company, the kind of thing Begley had done for years.

"Visibility was nil. I reached my hand out, groped along the bottom, and suddenly something bit my finger hard and held on. I snatched my hand back, and then saw it was a big, round electric ray. It didn't zap me until it was right in my face–and then I saw stars! I had been talking to my wife, and suddenly all I could make were gagging noises. It took my breath away.

"Natalie was in a panic. She kept hollering, 'What's the matter?' She thought a shark was eating me. She started jerking my hose, trying to get me up. Finally I made it to the surface. When she pulled me alongside, all I could get out was 'I'm OK.' She had to help me back into the boat."

Begley had been zapped with a burst of the electric current the ray uses to stun its prey. Lethargic creatures with flabby bodies, torpedoes, or electric rays, have traded the grace and speed of other rays for their Jehovah-like thunderbolts. Pacific coast divers see them hovering off the bottom like UFOs, afraid of nothing, steering their bodies with a small muscular tail, swimming by gently rippling the edges of their disk.

"A lot of times torpedo rays travel in groups. If you see one, you will usually see more than one," says Biggs Metzger, who lives in Carpenteria, California, and dove for abalone for 14 years. "They will follow you around. Once I was swimming up a kelp stalk, looking down at this big ray coming at me, and I came up underneath his buddy. Just as I looked up, the metal frame around the outside of my faceplate must have made contact with the bottom of the ray. Blue sparks started jumping across the inside of my mask. It scared me pretty good."

Richard Bray of California State University, Long Beach, and his team have been studying the rays for years off Southern California. Some grow to six feet, weigh 200 pounds and can generate a thousand watts of power–a kilowatt, enough to run a small motor or even stop a diver's heart. "We had a student who could always tell when the rays were coming," Bray says. "He claimed he could feel it in the fillings in his teeth."

In a bizarre "star wars" of the kelp beds, Bray has seen the slow-moving fish rise off the bottom at night, swim over rocky ledges and intercept a jack mackerel in mid-water. In a fifth of a second, the black-spotted ray lunges forward, discharging its electric organ. Each blast of electricity lasts only five-thousandths of a second, but can be strong enough to shatter the prey's vertebrae and liquefy its tissue. Wrapping its disk around the victim, the ray works the hapless fish into its wide mouth head-first and then slowly moves on.

Electric fishes from both fresh and salt water include (clockwise from the top left) torpedo ray, catfish, infamous eel, another ray and two "elephant noses."

Some fish live in an electric universe

Electric energy is everywhere in nature, from the spectacle of lightning to the minuscule currents that carry signals inside our own bodies. All organisms produce electric fields, generated by neuromuscular activity, that "leak" out of the body. In most animals the field is extremely weak; in plants, it may be no more than a few billionths of a volt.

Hundreds of species of fish do much more, however, putting electricity to work for them by generating and discharging currents, either in bursts or steady electric fields around their bodies. Depending on the species, they may use their power for finding and attacking prey, for defense or for communication and navigation.

Scientists sort electric fishes into three categories. The first comprises the strongly electric species like the marine electric rays or the freshwater African electric catfish and South American electric eel. Known since the dawn of history, these deliver a punch strong enough to stun a human. In recent years, biologists have focused on a second category: weakly electric fish in the South American and African rivers that use tiny voltages for communica-

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Though sluggish, torpedo ray can emit discharge strong enough to liquefy tissue.

tion and navigation. The third group contains sharks, nonelectric rays and catfish, which do not emit a field but possess sensors that enable them to detect the minute amounts of electricity that leak out of other organisms.

In addition to the Pacific electric ray, about 40 other species of electric rays occur worldwide. Several are eagerly sought by medical researchers. The soft, white, kidney-shaped organs that generate the electrical discharges are storehouses of a neurotransmitter (a chemical compound that carries signals from one nerve ending to the next) known as acetylcholine.

When the acetylcholine system fails in humans, and impulses no longer travel normally from cell to cell, devastating diseases such as myasthenia gravis develop. Certain neural toxins in insecticides can also disrupt acetylcholine production. Treatment requires detailed understanding of this compound, so biochemists seek out electric rays as a source.

It was the hunt for electric rays to be used in lab studies that had us in the Gulf of Mexico off Apalachicola, Florida, at 3 o'clock one morning, aboard a chartered 68-foot shrimp trawler. An avalanche of squirming creatures emptied out from the net onto the deck. The glowing orange eyes of shrimp were everywhere. Hundreds of croakers beat their tails and splattered mud and water in our faces; blue crabs skittered all over the deck. Our eyes roved the confusion of life, searching for the mottled pancake shape of a lesser electric ray, the Brazilian numbfish (*Narcine brasiliensis*).

"There's one of your wish fish," Captain Edward Keith called out, pointing to a ray that had landed on its back, showing its white underbelly. "And there's another. And another."

"Wish fish?"

He laughed. "Sometimes a green deckhand sees one and asks, 'What's that thing?' We tell him, 'That's a wish fish. Close your eyes, make a wish and rub it between your eyes, and the wish will come true.'" He guffawed. "Then they wish they'd never touched it!"

Wading into the catch, we slid our booted feet through the mass of creatures, mindful of the venomous spines of the catfish. Wearing rubber gloves, we gingerly grabbed the rays by their sharklike tails, passing them across the deck to a large tank of seawater. They kept flipping, trying to connect the front of their charged disks with our hands to complete a circuit.

Whenever we were careless or our gloves had a tiny hole, we received a shock. In a two-year period we had collected or tagged more than 4,000 rays, but we never got used to it.

When we finished clearing the deck, several dead rays were left behind. To remove the electric organs, we pulled the smooth, mottled skin back with a scalpel, exposing the phalanx of living batteries, distinct from the rest of the fish's anatomy. The two kidney-shaped organs, symmetrically positioned on each side of the disk, occupy a third to a half of the body. We excised the white pulpy mass of electric tissues and dropped them into smoking canisters of liquid nitrogen to freeze them.

Made up of hundreds of hexagonal chambers filled with an electrolytic, jellylike substance, the organs house the electrocytes, the acetylcholine-rich cells that produce the charge.

In the electric ray, the columns of electricity-generating cells are arranged

Anne and Jack Rudloe of Panacea, Florida, write on marine biology and supply specimens to researchers.

An inhabitant of South American rivers, electric eel has weak and strong electric capabilities–the former are used for detecting prey, the latter for killing it.

side by side, while in the electric eel they're arranged end to end like the batteries in a flashlight. There are about 500 to 1,000 parallel columns, each containing about 1,000 electrocytes. A good-sized ray can also contain a million electrocytes. Each cell produces about one ten-thousandth of a volt. When the electric organ discharges, the cells fire simultaneously, producing an electric field in the water around the entire fish.

Humans generate electricity, too, of course. Tiny pulses of current move along our nerves. And it is electric signals that keep the chambers of our hearts beating and the valves opening and closing in the right sequence. During cardiac arrest, the human heart can sometimes be restarted by electroshock treatment. Death is now said to occur when the brain ceases functioning and stops producing electrical impulses.

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Early scientists form a circuit with electric ray to "experience" a current.

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bottom-dwelling polychaete worms intact to the last anatomical detail–not a severed segment or a piece of damaged tissue anywhere. We have watched the speckled pancakes grab buried worms in their narrow, tubular mouths and blast them with biological lightning, paralyzing them and pulling them limply out of their burrows like strands of spaghetti.

On the deck of the trawler we tagged and released the surplus rays, watching them laboriously work their way down into the depths. Sharks and porpoises snapped up everything coming off the boat–except the rays, which were left strictly alone. As one ray drifted toward the bottom, a six-foot blacktip shark materialized beside it like an apparition, scrutinized it, then faded back into the murk. Did the ray discharge a warning pulse when it felt the pressure wave of the big fish closing in? A shark's electroreceptors are sensitive enough to pick up the fraction of a thousandth of a volt around a buried crab; a burst from the ray would have been agony. But if the slow-moving creature waited until it was bitten before discharging, it would have been too late for the ray.

Scientists have shown that dogfish sharks swimming in a laboratory pool easily find and attack a buried flounder even when any odor is masked by the experimenters. They also attack electrodes that produce a weak current like that of the flounder. Nurse, blue and horn sharks detect and attack electrodes that produce a small fraction of a millionth of a volt, both in the laboratory and the open sea (SMITHSONIAN, May 1993). A person standing in seawater produces an electric field so relatively strong that a cruising shark can detect the individual eight times as far away as it can detect a fish.

Only once have we seen evidence of a shark attack on an electric ray. The net brought up an active, healthy ray with a nine-inch semicircular bite. Since the bite marks on the top and bottom surfaces were scarcely a millimeter deep–they were more like

Tribes in Africa used electric catfish to help cure fevers, strengthen children.

scratches–we concluded that the jaws that normally deliver 2,000 pounds of pressure had sprung apart before they had fully closed.

Skates and electric stargazers are the only other saltwater fish known to have electricity-generating organs. Unlike skates and electric rays, which have cartilaginous skeletons, the stargazers are true fish, with bony skeletons. Shrimpers call them "440s," while electric rays are "220s," but it should be the other way around. Stargazers put out a maximum of only about 50 volts. They just look more formidable, with white warning spots studding their golden brown skin and frowning foreshortened bulldog faces.

The eyes sit on top of the stargazer's head, and behind each one is a small electric organ. Lurking buried in the sand with only its eyes sticking out, gazing skyward, it waits for small fish to pass by. When one does, the foot-long stargazer explodes upward in a motion so quick that no human eye can follow, emitting a single high-frequency burst of pulses and simultaneously sucking the victim into its gaping mouth.

Skates also have a small electric organ in their thorny tails. But even when grabbing them by those convenient handles to throw them overboard with wet, bare hands, we felt nothing. They use their one to four volts for communication rather than defense or attack. Like sharks, skates have extremely sensitive receptors with which

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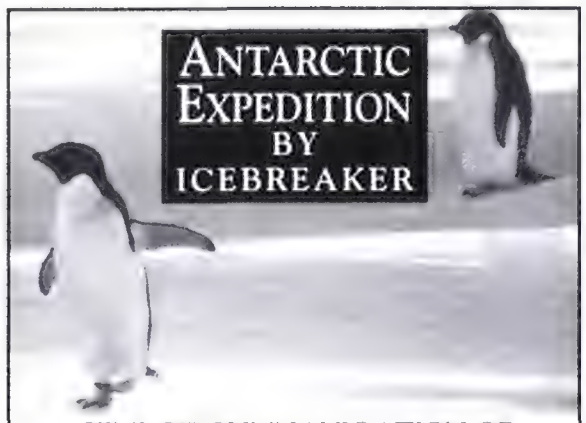

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they can detect minute electrical fields generated by their prey.

In recent years, scientists have also turned their attention to species of weakly electric freshwater fishes that communicate electrically. In African rivers and lakes, more than 200 species of electric fish called mormyriforms (known in aquarium shops as elephant noses, baby whales and snout fish) use tiny electrical impulses for navigation and communication. In some areas they can make up to 75 percent of the total weight caught by fishermen. Unrelated gymnotiforms (knifefish) in South America also maintain tiny fields of only a few thousandths of a volt around their bodies and use them for communication, navigation and the defense of territory in those turbid waters.

The largest of the gymnotiforms, however, is justly famous for the power of its electric discharge. The South American electric eel, which can grow to five feet and 44 pounds, can produce 650-volt discharges–enough to stun a human being. The eel (actually not an eel at all but a true fish related to the carp) has three electric organs. A small one at the tip of its tail is used for electrolocation, in much the same way a bat uses high-frequency pitches for echolocation. Another small organ apparently triggers the large one that produces the prey-killing shocks. Together they occupy four-fifths of the eel's body. All the other organs are crammed into the front, resulting in a small fish with a huge electric tail.

Years before, we had traveled up the Marowijne River in Suriname, trying to capture live electric eels and other fish for the New York Aquarium. Our nets brought up freshwater stingrays, grunting armed catfish, plenty of piranha, paku paku with nut-shattering teeth, a few weakly electric knifefish–but not any eels.

On the last day of our trip we were camped in a small village. Several fishermen paddled up to the bank in a dugout canoe, with two five-foot electric eels among their catch. The eels were dying: machete slashes on their

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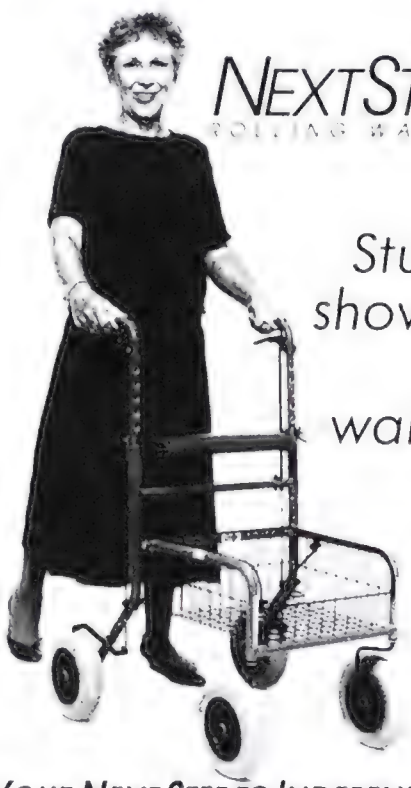

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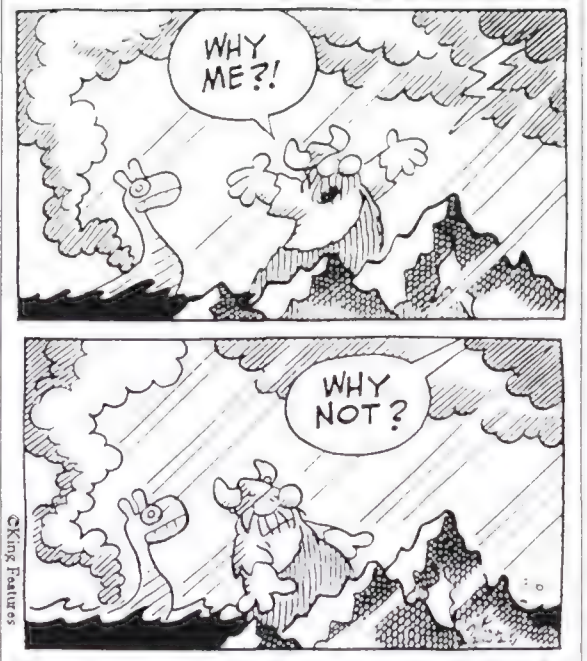

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sides exposed the white electric organs. Why did they kill them? we asked. To keep from getting shocked when they hauled them into the boat, of course. It was inconceivable to the men that we wanted the eels alive.

People in the Amazon say the eels wait beneath trees for the fruit to ripen and drop. Up and down the Río Negro, fishermen insist that repeated shocks not only speed up the ripening of the waxy purple assaí palm fruit but physically jolt it off the branches as well.

Labbish Chao, an ichthyologist, laughed as he related one bit of Amazonian folklore: "One of my most reputable students swears he was climbing a tree when he was a kid and was shocked and knocked down," he said. "He saw a big eel swim up and hit the tree. It caused the branches to shake and the whole tree to vibrate and sent him and the fruit crashing down into the water."

But some say it's not the fruit the electric eels are after, it's the little fish that come after the fruit. The eels knock the "bait" into the water, wait for the fruit- and nut-eating fish to come, and electrocute them and feast.

Others of the more than 80 species of electric fish in South America use their unusual power in more subtle ways. Slender electric knifefish hang head down, hidden beneath undercut banks in the muddy tropical rivers, swaying back and forth with the vegetation in the currents. For years their tiny electric organs perplexed scientists, who called them "pseudoelectric organs." The organs resembled classic

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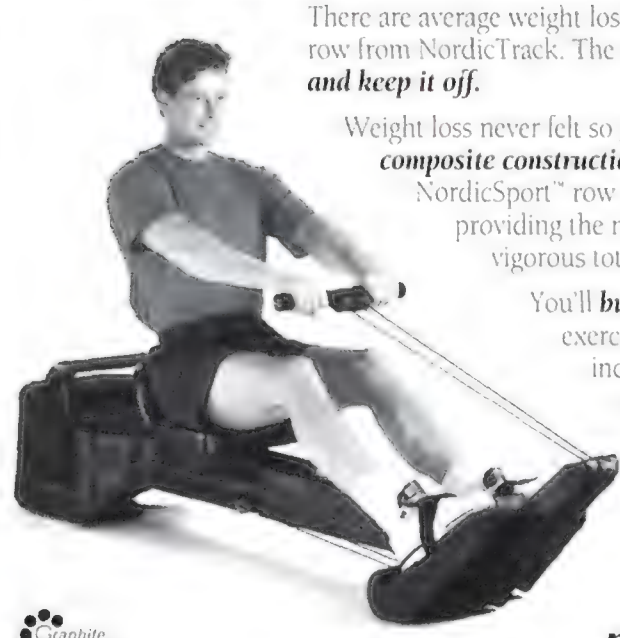

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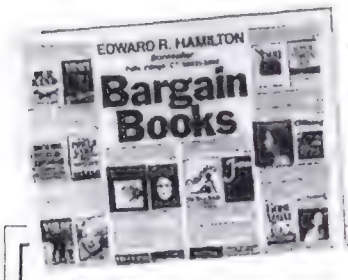

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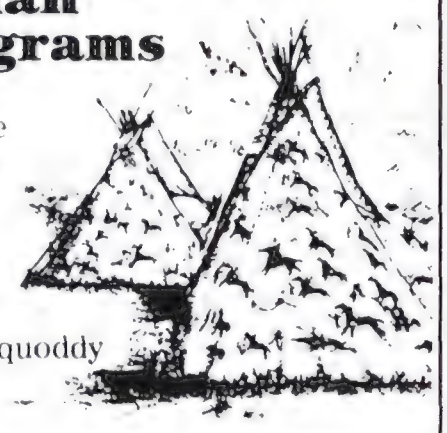

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electric tissues, but there was no tingling when they were handled.

It was not until the 1950s that biologists placed electrodes connected to amplifiers into tanks and discovered that knifefish emit a weak electric field. They don't release bursts like the eel, the ray or the stargazer do, but continually emit low-level pulses or waves. Through tiny receptors in their skin, the fish sense distortions in their own electric fields caused by tree roots and other objects around them whose conductivity differs from that of water. Thus they can easily navigate in the muddy water, even at night.

With their receptors, knifefish can discern whether an approaching object is alive or inanimate, predator or prey, and act accordingly. Their electric field is alternating current, making them invisible to the river catfish, which are sensitive to direct current. The two groups live side by side in different electric universes.

Several species swim and feed in a school; when hundreds of electric fish come together there's pandemonium. An electrode hooked to an amplifier and speakers allows us to convert the inaudible electrical signals into a form we can hear–an uproar of electric love songs, aggressive calls, submissive displays and announcements of a caller's species, sex and size. The equivalents of electrical hoots and chirps, sensed by the fish as waves or pulses of electricity, let every other electric fish know who's in the area, what species and size they are, and whether they are males or females who do or do not want to breed. Each species has its own "channel" that enables the fish to sense one another through the general hullabaloo.

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Electric eels apparently prey on weakly electric fish, among others, homing

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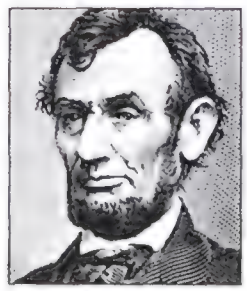

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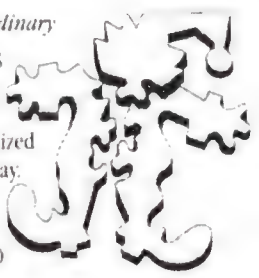

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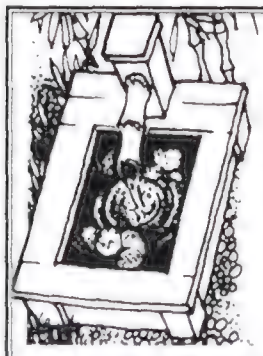

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Skate's sensitive electroreceptors are used for communicating, finding prey.

in on their signals while the fish forage for aquatic insect larvae and crustaceans. Max Westby, a British scientist, was using electrodes to record the pulses of a knifefish when the electrodes picked up the emission of an approaching electric eel. Detecting the eel, the knifefish hastily shut off its electric discharge. But as soon as the discharge resumed, the eel homed in. Westby recorded a series of high-voltage discharges, saw a great splashing and turbulence, and then heard a continuous low-frequency buzz that faded as the eel swam away. The knifefish's signal was heard no more.

Carl Hopkins at Cornell University has studied electric fish behavior for decades in Africa and French Guiana and in the laboratory. He is fascinated by the way in which large parts of their brains are specialized for processing electrical input. "It's totally dominated by the electric modality," he explains. "In mormyrids, the cerebellum is so big that the brain-to-body ratio is equal to that of mammals. It just grows out and mushrooms over the whole brain like the primate cerebrum."

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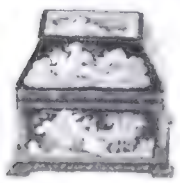

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room where fish of a dozen African and South American species are lying quietly in tanks; the delicate fins that circle the posterior ends of the fishes' bodies ripple in wavelike motions. Electrodes in the water sputter as they pick up the electrical discharges with which the fish monitor their space. When the signals are amplified and converted into sound, the result is extraordinary. One courtship call was like the low hum of a didgeridoo, the Australian aborigine wind instrument. Another was a rasping noise. A third was a low-pitched, thudlike drumming, together with a female's click. Against a chorus of deep hums with higher background notes, one species sounded like a car horn. Some have been likened to trilling flutes, others to airplane engines.

A timer switch turned the lights out, and night fell. Rain from overhead pipes pattered into the tanks. Outside it was still a winter day, but inside it was nearly 90 degrees F, the closest one could get to a rainy tropical night.

"They breed during rainy season," explained graduate student Cheryl Franchina. "In the dry season everybody is in shrinking pools, and predation is intense. The young are especially vulnerable. The water becomes deoxygenated. More habitat becomes available in the wet season when rivers overflow their banks and flood the forest, and there are more insect larvae for food."

Our eyes adjusted to the dark, and we could see dim black shapes moving. A shy male remained hidden in his

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shelter, but a female was out and moving around, approaching an electrode, then turning around again. She darted forward and backward, waves of ripples racing along her gossamer fins.

During courtship, the female of one species approaches a male in his territory; he "chirps" at her. The chirps of a male to other males are abrupt, while those made to a female are more drawn out and atonal. In another species, if the female turns and moves away, the male lets forth with what translates acoustically as an electrical howl.

Back in his office, Hopkins pondered how the fish themselves perceive the electric fields and signals. What is it like to the fish, this sense which is so unlike any that we humans can experience directly?

"The fish are aware of the geometry of the field. We researchers have only one electrode—a single point in space—so we pay attention to how the electric field varies in time. But they have receptors all over their bodies, and they sense [the field] as a space. More like a sense of touch. Like pressure if an object came close. It would be similar to putting your hand next to an electric heater: the heat would feel stronger as you got closer."

All of the electrosensitive fish live in a universe about which we know almost nothing. To us the ocean is a faceless void, but to a shark it may be a maze of electric signposts. Other animals inhabit still other universes. Lobsters, with as many as half a million receptors on their bodies, live in a universe continually surrounded by ever-changing chemical "odors." Many animals, especially some insects, reputedly sense a magnetic universe by means of ferromagnetic crystals in their brains.

Even though we ourselves generate electric fields, we really have no idea of what it is like to be able to sense them. Henry Beston said it best in *The Outermost House*: "In a world older . . . than ours, they move finished and complete, gifted with extensions of the senses we have lost or never attained, living by voices we shall never hear."

Like sandfish, though unrelated, "elephant nose" mormyrid is nocturnal. It communicates with others via discharges from electric organs at base of tail.

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Book reviews

Joseph Banks: A Life
Patrick O'Brian
David R. Godine, $29.95

Anyone who regularly reads historical novels or remembers with pleasure C. S. Forester's Horatio Hornblower sea stories probably already knows about Patrick O'Brian. Over the past two or three years O'Brian's adventure novels about Captain Jack Aubrey and surgeon-spy Stephen Maturin—there are about 15, all set during the Napoleonic Wars—stopped being coterie classics and found a wide, appreciative audience. Reviewers competed in their choice of superlatives; bookstores vainly tried to keep *Master and Commander* or *The Letter of Marque* in stock. After a lifetime of writing and translating (Simone de Beauvoir, among others) Patrick O'Brian was, at nearly 80, a literary celebrity.

One benefit of that renown is the American publication of O'Brian's 1987 life of Joseph Banks, the 18th-century naturalist who accompanied Captain Cook on his first voyage to the South Seas and who later became the president of Britain's scientific Royal Society. The biography rivals the Aubrey-Maturin novels as genial, civilized entertainment.

Rich, outdoorsy and immensely likable, Joseph Banks (1743-1820) did poorly at Eton, showing little interest in Latin or Greek. Outside the classroom, however, Banks discovered botany and thus his life's work.

Oxford followed, as well as a short voyage to Newfoundland and Labrador, collecting new plants and animals. Then came the chance of a lifetime. After a bit of string-pulling, the 25-year-old Banks landed a berth as a naturalist on the voyage of the *Endeavour* to Tahiti. At age 40 her captain, James Cook, embodied "all the seaman's amiable qualities: courage, resolution, modesty, and the gift of being good company, as well, of course, as great professional abilities and natural authority." He would need them all.

Like war, a long sea voyage—and the *Endeavour*'s took from 1768 to 1771—offered weeks of boredom interrupted by moments of sheer terror or occasional delight. While collecting specimens near Tierra del Fuego, Banks and several companions were caught in a snowstorm; two men froze to death. In Tahiti he nearly fought a duel over an island girl.

After observing the transit of Venus across the sun—*Endeavour*'s primary mission—the ship left Tahiti and "began a voyage through unknown seas." Cook eventually sailed around New Zealand, avoiding cannibals. Then he explored some of the coastline of Australia, naming Botany Bay partly in honor of Banks. At this point Cook's luck turned. While starting for home, the ship was nearly wrecked on the Great Barrier Reef. Even worse, after stopping at disease-plagued Batavia to take on water and supplies, the *Endeavour* was swept by fevers and dysentery that left more than two dozen men dead.

Once back in England, Banks found himself famous. Settling down to catalogue his thousands of plant specimens—at first with the help of Edward Jenner, who later developed a safe process of vaccination against smallpox—he was drawn into what one might call science administration. Elected president of the Royal Society at 35, a post he held for the next 42 years, he supported research projects around the world and corresponded with the leading minds of Europe: O'Brian cites an estimate that Banks wrote, without a secretary, some 50 letters a week. He regularly entertained Henry Cavendish, Joseph Priestley, the astronomer William Herschel and many others now famous in freshman textbooks everywhere.

O'Brian tells Banks' story in a high style, almost Augustan in its diction but laced with witty asides and anecdotes. He writes with relish of the politician John Wilkes, "one of the few Lord Mayors [of London] ever to have edited Catullus and Theophrastus and to have been an outlaw." We learn, with some amusement, of Banks' strenuous and ultimately successful effort to introduce Spanish Merino sheep into England. Not least, O'Brian reminds us that Banks advised the House of Commons—in "the most important statement he ever made in his life"—that Botany Bay would be an ideal place to send prisoners. In later years the Royal Society's president found himself vexed by the new colony's weak governors, scheming military commanders and the difficulties of its abused naturalists.

Throughout *Joseph Banks: A Life*, Patrick O'Brian reveals not only a well-researched understanding of his subject, but also an unabashed liking for him—a fine thing, as few men can remain heroes to their biographers. Certainly any reader of this excellent book will close its final pages with a similar affection for Banks, of course, but also for O'Brian.

Michael Dirda is a writer and editor for the *Washington Post Book World*.

The Aye-Aye and I
Gerald Durrell
Arcade Publishing, $22.95

It is a great comfort in this videocentric age to open a book, surreptitiously if need be, and discover in paragraph one of page one that you're in the hands of a writer delighting in writing, and thus delighting you. "In the gloom it came along the branches towards me," *The Aye-Aye and I* begins, "its round, hypnotic eyes blazing, its spoon-like ears turning to and fro independently like radar dishes, its white whiskers twitching and moving like sensors. . . . It looked like a Walt Disney witch's black cat with a touch of E. T. thrown in." A lead like that is an invitation to seize something soothing and settle in because you're about to embark on the pleasure cruise that a good book is.

I've never looked upon Gerald Durrell nor even seen a photograph of him that I recall, but I can picture him in my mind's eye through his writing: paunchy, pinkish in the British manner, a shade

An aye-aye checks out Gerald Durrell. Finding no grubs, it returned to tree.

past middle age, not Colonel Blimp exactly but moving that way, perhaps Captain or Major Blimp; but also gimlet-eyed, puckish, eccentric and given to outrageous asides. Durrell has both a gift for enjoying himself and a strong sense of responsibility to nature and the wildlife he helps protect.

But the first and last fact about Durrell is that he's a writer, he's someone you want to listen to or wander with or indulge because it's almost always worth it. Here the venue is Madagascar and the mission is saving the unique aye-aye from the extinction that seems so ominously near in a country where 90 percent of the forest has already disappeared, and it's a fine and lively tale set against a wonderfully exotic background. But Durrell's eye and humor and skills are such that I suspect he could transform an account of two weeks in Oakland (that's my analogy; his might be Manchester or Birmingham) into a good read.

Here he is with banners flying, describing a mating fight between a pair of rare, 60-pound ploughshare tortoises:

"The two males, rotund as Tweedledum and Tweedledee dressed for battle, approach each other at what, for a tortoise, is a smart trot. . . . They stagger to and fro like scaly Sumo wrestlers, the dust kicked up into little clouds around them, while the subject of their adoration [shows] about as much excitement and enthusiasm as a plum pudding. Finally, one or other of the suitors gets his weapon in the right position and skidding along and heaving madly he at last overturns his opponent. Then, he turns and lumbers over to gain his just reward from the female, while the vanquished tortoise, with much leg-waving and effort, rights himself and wanders dispiritedly away."

It seems to me that the use of metaphors and other elegant figures of speech in writing is declining at about the rate of the Madagascar aye-aye, so it's a pleasure to encounter descriptions of "moths the size of Regency fans" and a hammerhead shark with "an arch-shaped mouth like a medieval church door." To Durrell, the great and benevolent baobab trees stick through lesser trees "like an army of Chianti bottles."

The aye-aye who shares the stage with the author in this tour de force of nature writing looks like something an overstimulated cartoonist might have dreamed up. Besides the round eyes and spoonlike ears it has a bushy tail and a long, bony middle finger (thus the E.T. comparison) that it employs with extraordinary delicacy. An aye-aye lays siege to a coconut first with its chisel-like teeth and then with its magic finger, dipping into the milk and spooning it rapidly to its mouth. It also uses this magic digit in hunting for grubs, tapping it on hollow logs and reacting to the sound in what scientists suspect may be a process similar to echolocation in bats.

Durrell and his touring troupe, including his wife, a film crew and assorted cohorts and hirelings, roam Madagascar in search of tortoises, lemurs, jumping rats and aye-ayes to ship back to their zoo on the Isle of Jersey for captive breeding. The author gets miserably sick ("if anyone sidled up to me and made me an offer of five farthings for all my internal organs, I would accept it without hesitation"), endures indignities ranging from bone-rattling roads to disrespectful ducks, and emerges with the target species in tow and his sense of the ridiculous intact. In parting he offers an olfactory evocation of Madagascar that reminds us how memories attach to aromas, while rendering a vivid sense of place: "the musk of cloves, the sweetness of vanilla, the welcoming smell of cooking fires and that subtle, indefinable smell of sunlight on green leaves."

A diffident epilogue reports on the progress of his wildlife-protection efforts and lists addresses for those who want to participate in his fine cause. I suspect he dropped the sermon in at the end because moralizing doesn't come as naturally to him as wit and irony, which I count as another quality of a good writer.
Donald Dale Jackson writes from his home in rural Connecticut.

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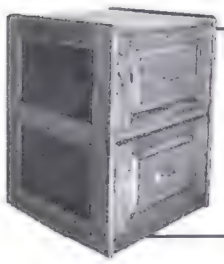

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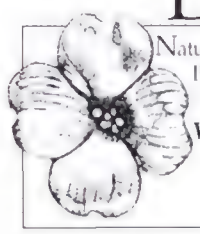

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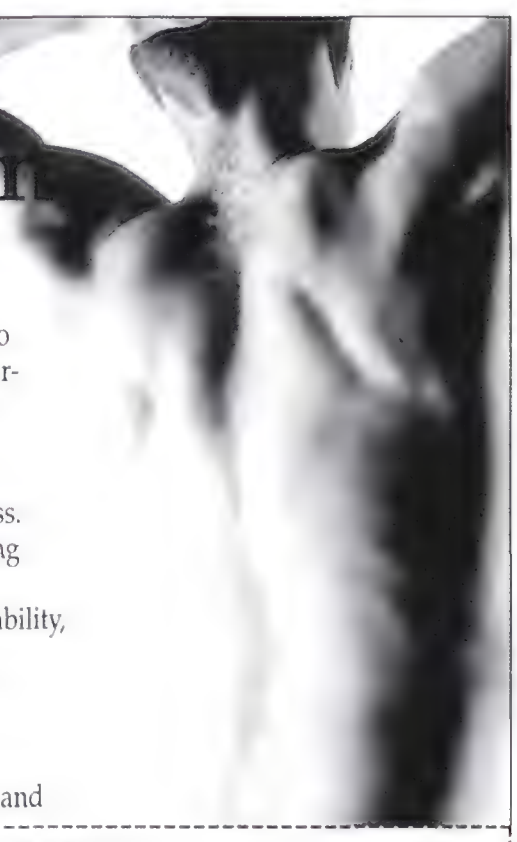

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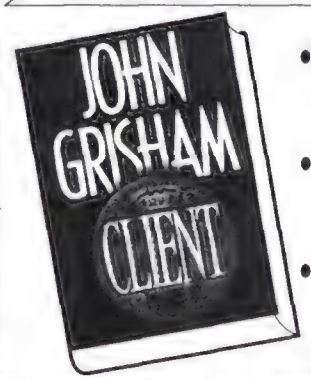

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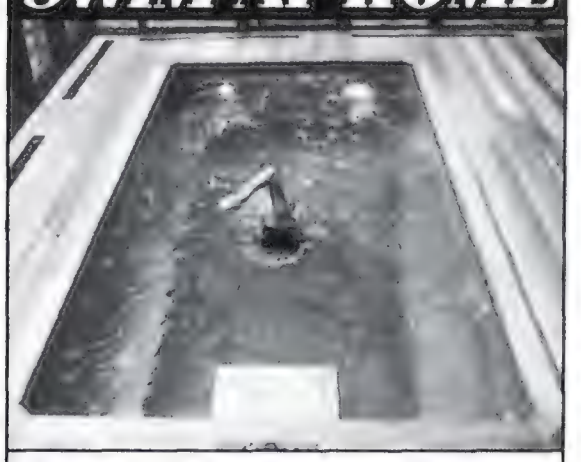

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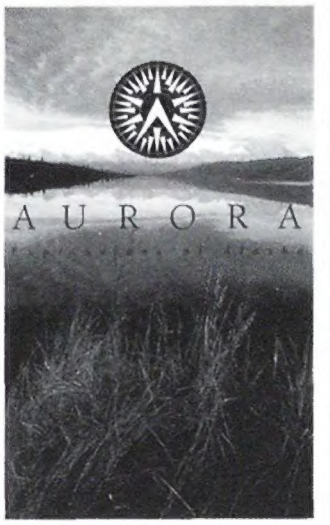

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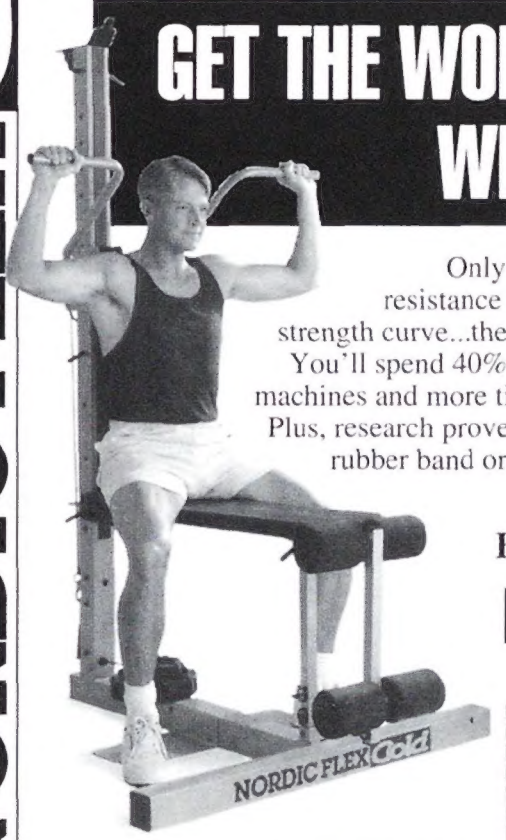

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By Robert W. Creamer

If your best friend acts like Angus, you don't need an enemy

My dog is black. He is a little dog. His name is Angus. Most people think he is a Scottie. But he is not. His mother was a Scottie, but his father was not. His father was something else. Some say his father was a spitz. This may be so. But Angus does not look like a spitz. He looks like a little Scottie. He is all black.

My dog barks. He barks quite often. He barks at the mailman. He barks at the garbageman. He barks at the milkman. He barks at the laundryman. He has a very loud bark. He barks a long time. His bark is very annoying.

His bite is worse than his bark. He has very strong teeth. He likes to bite. He likes to bite the mailman best. He has bitten the mailman many times. Angus is not particular. When a new man is put on the route, Angus bites him too. Angus does not like uniforms. One day when the policeman came to see if Angus had his new license, Angus tried to bite him. But the policeman was too fast for Angus. Angus barked and barked. But the policeman poked him with a stick, and Angus did not bite him. We were very embarrassed because Angus did not have his new license, and we thought it might be against the law to bite a policeman without a license.

Angus is our watchdog. Sometimes when I come home alone late at night I pretend to be a burglar and sneak quietly into the house. Angus waits at the top of the stairs, looking down at the door. He is a very careful dog. When I open the door and slide in, he keeps very quiet. But when he sees that it is only me and not a burglar, then he feels much better. Then he barks. He barks until everybody wakes up so that he can show them it was not a burglar.

Angus is a much better watchdog early in the evening or during the day, when lots of people are around. Then he will bark at anyone without waiting to see who it is. He is very alert. If I get up and walk outside and turn around and come right back in, Angus leaps up, his hair bristling, his teeth bared, and growls deep in his throat between the barks. Even after I pet him and tell him to lie down and be quiet, he growls a little as if to say, "So-oo-oo, Master! I am a very alert watchdog!"

At night he is much quieter, unless he knows who it is.

Angus loves to fight. He is really very brave. He will fight anything. Usually he gets badly bitten, and we have to take him to the veterinarian and pay a lot of money to have him bandaged up. Then we nurse him back to health. He is very grateful. He runs outside and over to the neighbor's yard. He tries to chase the neighbor's dog out of the neighbor's yard. The neighbor's dog bites Angus. Then we have to take Angus to the veterinarian again.

Angus likes best to fight dogs as little as he is. Then he does not get bitten so badly. One day when I was walking with Angus he saw a little wirehaired he did not like. Angus growled and broke away from me. The little wirehaired growled. She waited for a minute and then turned and ran. Angus chased her through a hedge into a yard. A big brown Airedale was in the yard. A big black-and-white terrier was also in the yard. They were the little wirehaired's friends. Angus stopped very quickly. He decided he would not stay in that yard. He turned to go. The other dogs decided he would stay in that yard. And he did not go. Very soon Angus was lying on the ground, and the other dogs were taking turns biting him. The little wirehaired was taking turns with the big Airedale and the big terrier. I had to rescue Angus. I had to throw stones at the other dogs and say, "Here, sir! Here, now!"

It was great fun, throwing stones at other people's dogs in their own yards. The other dogs let Angus get up. Angus got up. He left the yard very quickly. He did not wait for me to walk home with him. He went home by himself. Angus runs very quickly for a dog with such short legs.

Angus likes beer cans. I like beer. But I do not throw the beer cans into the backyard. I throw the beer cans into the trash can and put the cover on top. I am not ashamed of liking beer. But sometimes neighbors don't understand. Sometimes they exaggerate things. So I drink the beer in the house and put the cans carefully in the trash can. But Angus is very smart. He runs down the street to a place where there is an embankment alongside the road. Here people going by in cars throw beer cans. You cannot see the beer cans from the road. But Angus can find them. Every day he goes down the street and gets a beer can and brings it back to our own yard. He bites it and worries it and growls at it until everybody watches him. Then he takes it over to the neighbor's yard and tries to get the neighbor to throw it for him. The neighbor says to me, "I wish you'd put those beer cans of yours in the trash barrel. They look like hell lying around the yard." I did not know the neighbor until Angus began to bring him beer cans. Now he and I talk frequently. Mostly about beer cans.

Angus is a swell little dog, all right. He is 7 years old. Dogs his size usually live to be about 14. Seven more years.

Then I hope to get a turtle for my pet.

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